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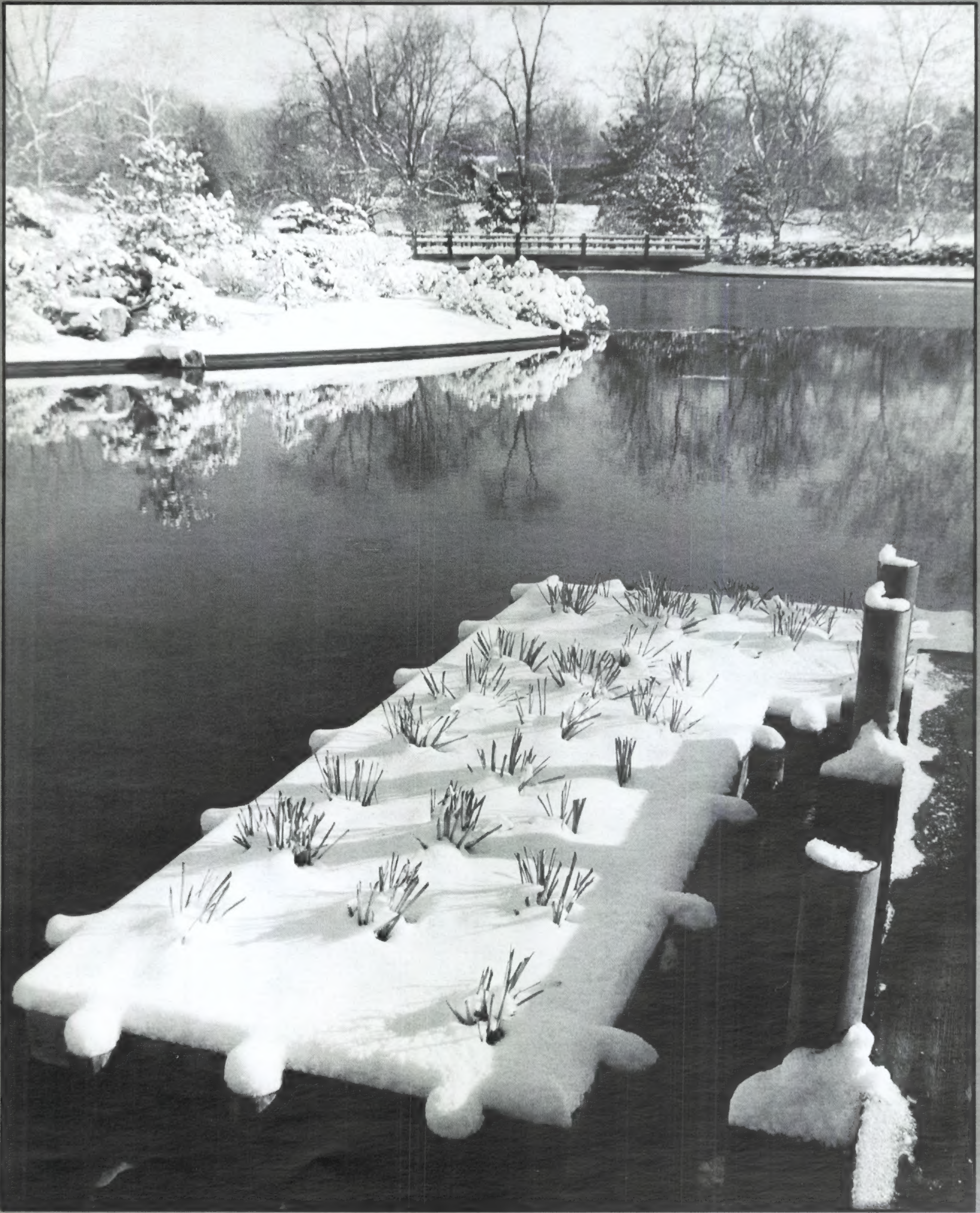
Missouri Botanical Garden Bulletin

JANUARY / FEBRUARY 1991



VOLUME LXXIX
NUMBER ONE

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On the cover: *Yatsuhashi* bridge in the Japanese Garden, *Seiwa-en.*
—*Photo by King Schoenfeld*

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The BULLETIN is sent to every Member of the Garden as one of the benefits of membership. For a contribution of as little as $40 per year, Members also are entitled to: free admission to the Garden, Shaw Arboretum, and Tower Grove House; invitations to special events and receptions; announcements of all lectures and classes; discounts in the Garden Gate Shop and for course fees; and the opportunity to travel, domestic and abroad, with other Members. For information, please call (314) 577-5100.

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Comment

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1990—A Year of Accomplishments

This past year has been filled with challenges, and we can look back over the last twelve months and feel invigorated at what we have accomplished together.

Thanks to an extraordinary show of support from the St. Louis community, the Capital Campaign was completed and exceeded our goal (see page 9.) The renovated Climatron opened to thousands of members in the Spring along with the Shoenberg Temperate House. The Kemper Center for Home Gardening, encouraged by warm weather throughout much of the Fall, made substantial gains in construction and will be ready to open the middle of this year. The article in the *National Geographic* about the Garden focused the attention of readers throughout the world on the mission of the Garden and its critical importance as we look toward the future and grapple with serious environmental issues.

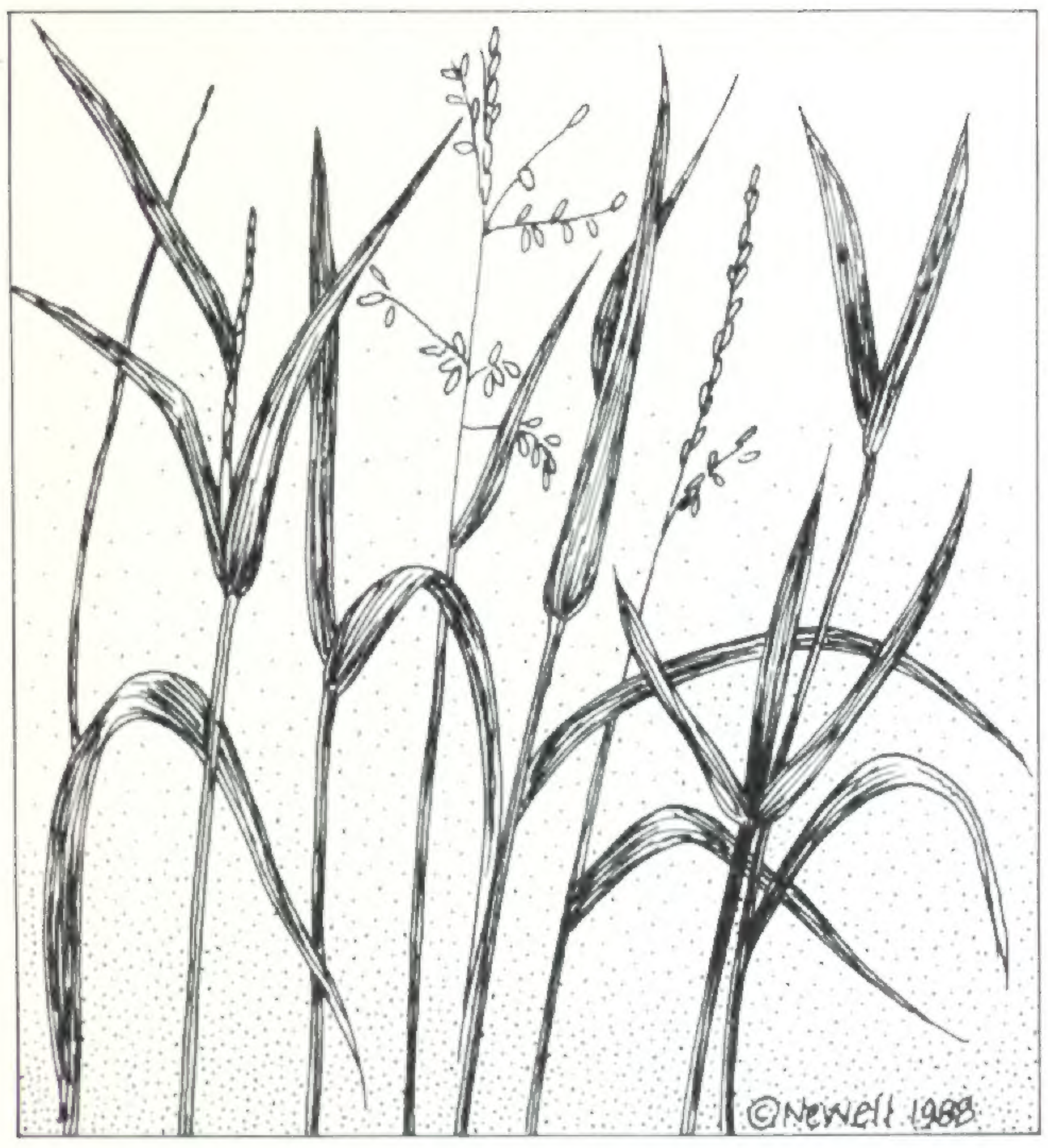
The Garden also invested considerable effort in learning how St. Louisans perceive the Garden and what it can do to better understand the community. The results of this extensive survey will allow the Garden to revise and adjust programs and services during 1991 to reach underserved areas. We are committed to this assessment endeavor and see 1991 as a year in which we will be able to learn and make changes that will reach out into the community.

Most importantly, we have made major strides in informing citizens about the environmental crises by providing information that will help people learn what they can do to lessen the serious risks facing the environment. And we look forward to continuing this responsibility throughout 1991 and beyond.

Our membership continues to grow and as each individual supports the Garden, at any level, the Garden's ability to do more and reach more people increases. Our growth and our responsiveness to environmental concerns is a direct result of each member's commitment and interest. We remain genuinely appreciative of your support.

Peter H. Raven

GARDEN ON CNN—Marc Levenson, field correspondent for CNN, visited the Garden in September to interview Dr. Nancy Morin on the Flora of North America project. The crew spent the day shooting in the Climatron and throughout the Garden for a news story that aired on CNN's weekend Science & Technology program in October.



◀ *A rare native plant with agricultural potential is* ***Texas wild rice****,* Zizania texana. *It grows only in a single stream in Texas, and is threatened by water pollution and grazing by introduced rodents. Fortunately it survives in cultivation and is being used in breeding experiments to produce new crops resistant to heat and drought.*

MISSOURI BOTANICAL
JAN 23 1991
GARDEN LIBRARY

Together the Garden and the CPC will form one of the most important centers of plant conservation and research in the world.

Center for Plant Conservation Comes to the Garden

On October 24, 1990, the Garden announced that the nationally renowned Center for Plant Conservation (CPC) would move from Boston to St. Louis as part of a new cooperative agreement. The CPC will become a part of the Garden and will open its new headquarters here at the Garden in 1991.

Founded in 1984, the CPC is the largest organization in the world dedicated exclusively to the protection of endangered plant species, specifically native American plants. It is the first program of its kind in the world. Together with the Garden's worldwide research and conservation programs, including the Flora of North America (see next page), the collaboration will make St. Louis one of the most important centers for plant conservation in the world.

Plant conservation is of critical importance among today's environmental concerns. According to research conducted by the Center, more than two-thirds of all endangered native plants are close relatives of economically important plants used for agriculture, medicine, industry, or horticulture. Loss of even a few species depletes the genetic diversity of plants, weakening their ability to adapt to changes in location, climate, or diseases. More research is needed as plants are threatened by many factors, including development of their natural habitats for housing, industry, or other human activities.

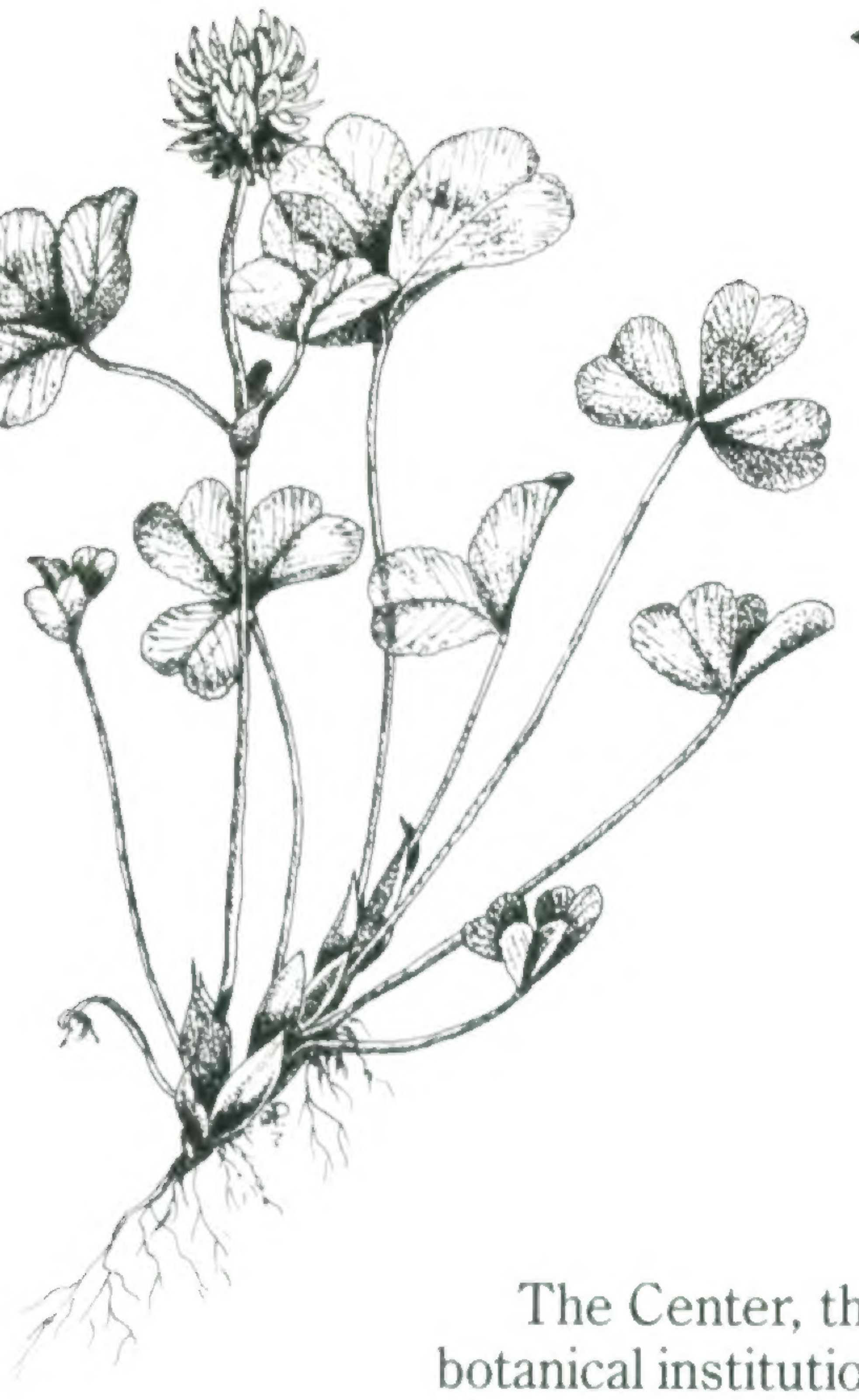
The CPC has pioneered innovative methods of preserving endangered plants. The first goal is to identify and find the threatened species, a task the Center carries out in collaboration with public and private scientific institutions, conservation organizations like The Nature Conservancy, and federal and state agencies. Working with these groups in a program of "integrated conservation," the Center helps to study and protect plant populations in the wild. "The survival of species in their natural ecological and evolutionary state is ultimately the test of any conservation program," says Donald A. Falk, director of the CPC.

continued on next page

"Our goal is to prevent any further extinctions of native American plant species. With hard work we are confident that this is an attainable goal."

—Donald A. Falk

Peter H. Raven, director of the Garden (left) and Donald A. Falk, director of the Center for Plant Conservation, examine a rare heart-leaved plantain at the announcement on October 24.



WAYNE PAGE

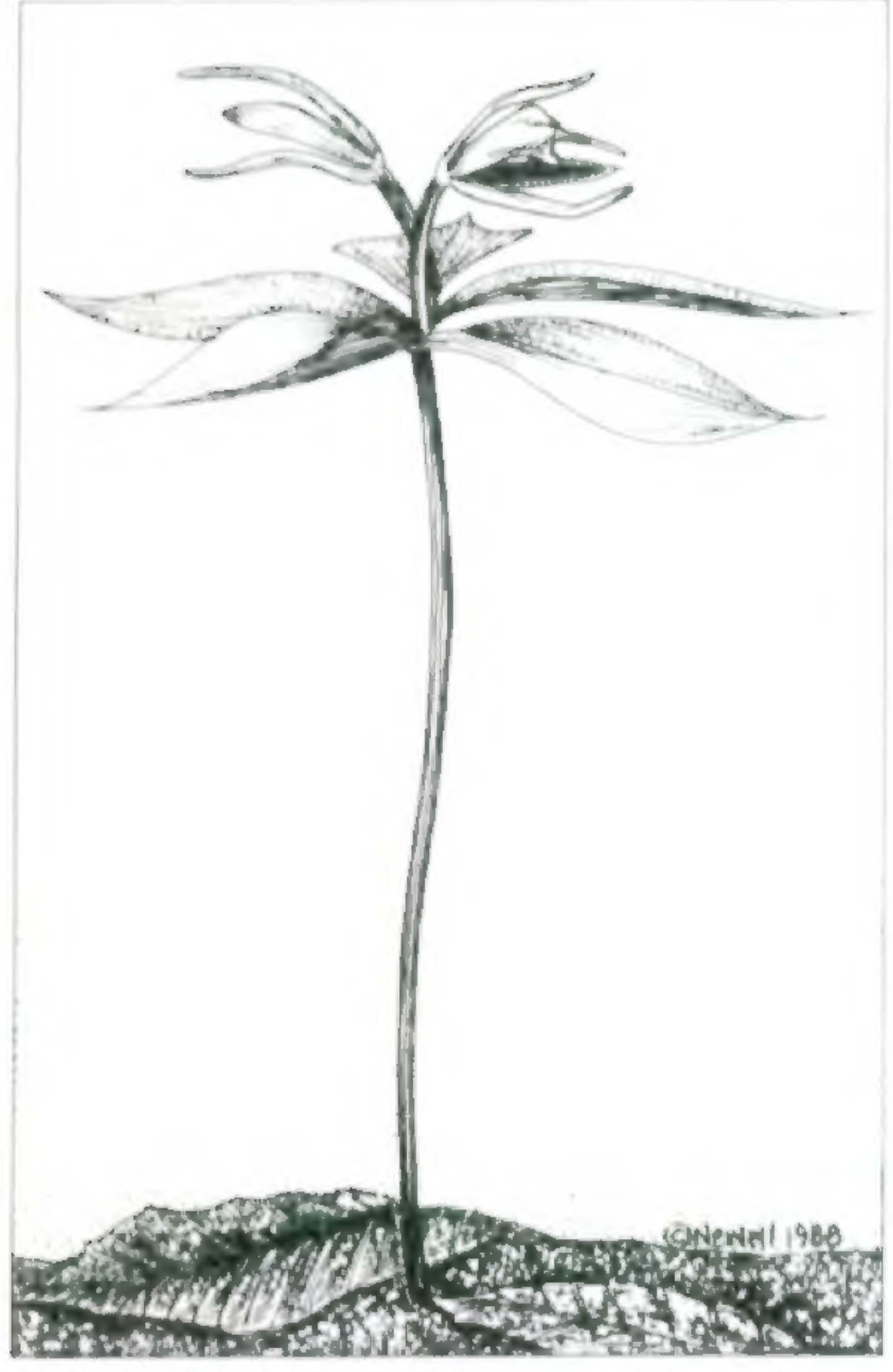
◀ ***Running buffalo clover****,* Trifolium stoloniferum*, recently became the first endangered species propagated at the Missouri Botanical Garden to be reintroduced to the wild (see the* Bulletin*, November-December 1990). Horticulturists report the new populations are thriving.*

Of the 20,000 plants native to the United States, more than 3,000—about 15%—are endangered in the wild. 700 species are faced with extinction in the next 10 years.

The Center, through a network of 20 participating botanical institutions (see map), collects endangered plants and brings them into protective cultivation for propagation and research. This forms the Center's National Collection, which has saved several species in each region from extinction. The Collection provides the opportunity to conduct research on rare plants, to learn how to propagate, cultivate, and utilize them, and how to encourage their survival in the wild. The protected populations are backed up by a low temperature seedbank maintained as part of the National Plant Germplasm System of the U.S. Department of Agriculture and at several of the regional gardens.

The National Collection is the heart of the CPC program. The living plant materials, consisting of stored seeds, rooted cuttings, growing plants, or other forms, are grown at the garden in the region where the species is native. Each participating institution is responsible for the rare flora of its region. The network provides centers for the research, education and conservation programs coordinated by the CPC.

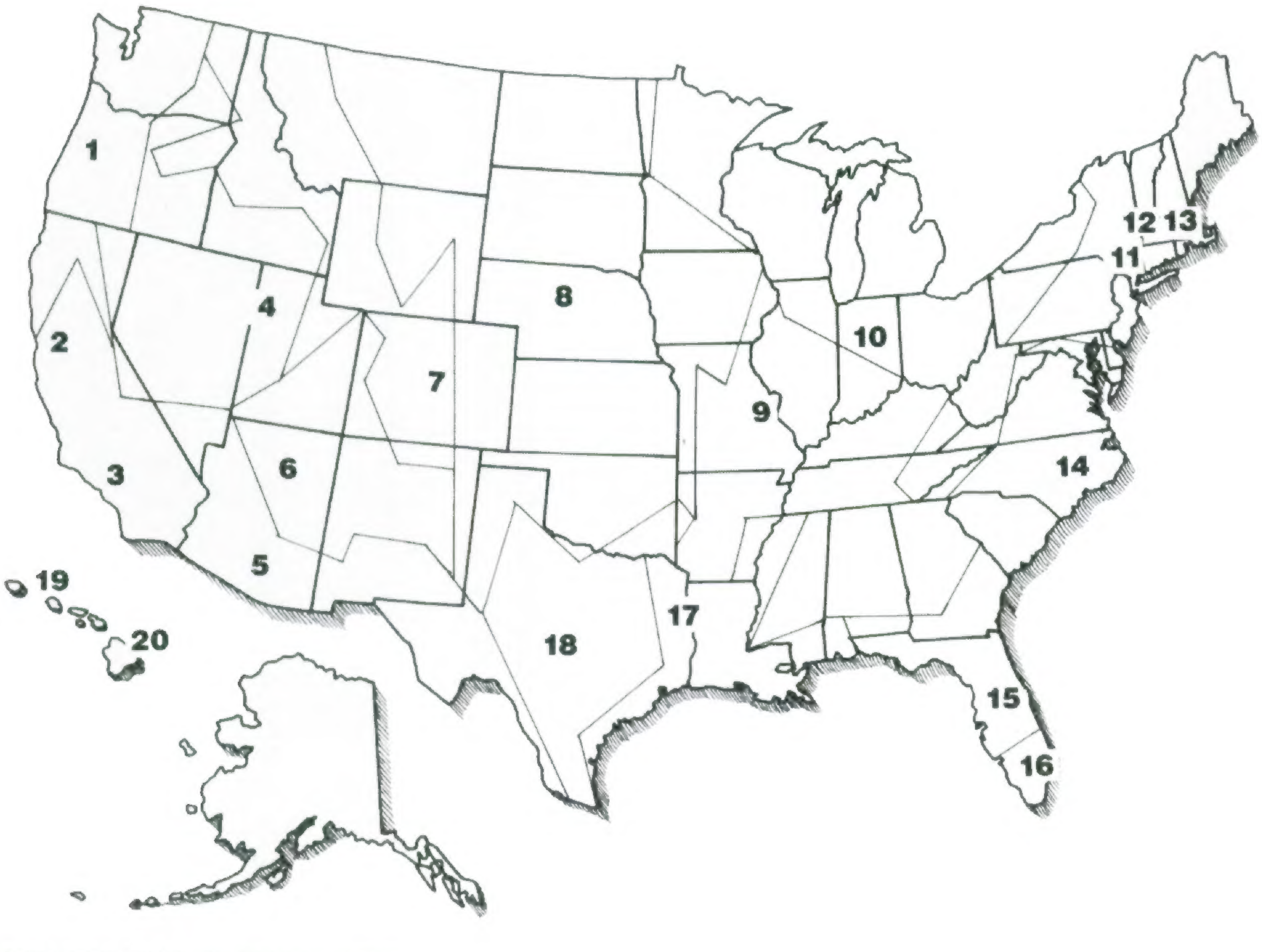
The collaboration of the Garden and the Center will benefit the cause of plant conservation in a number of ways. Research programs at the two institu-



MARY NEWELL DePALMA

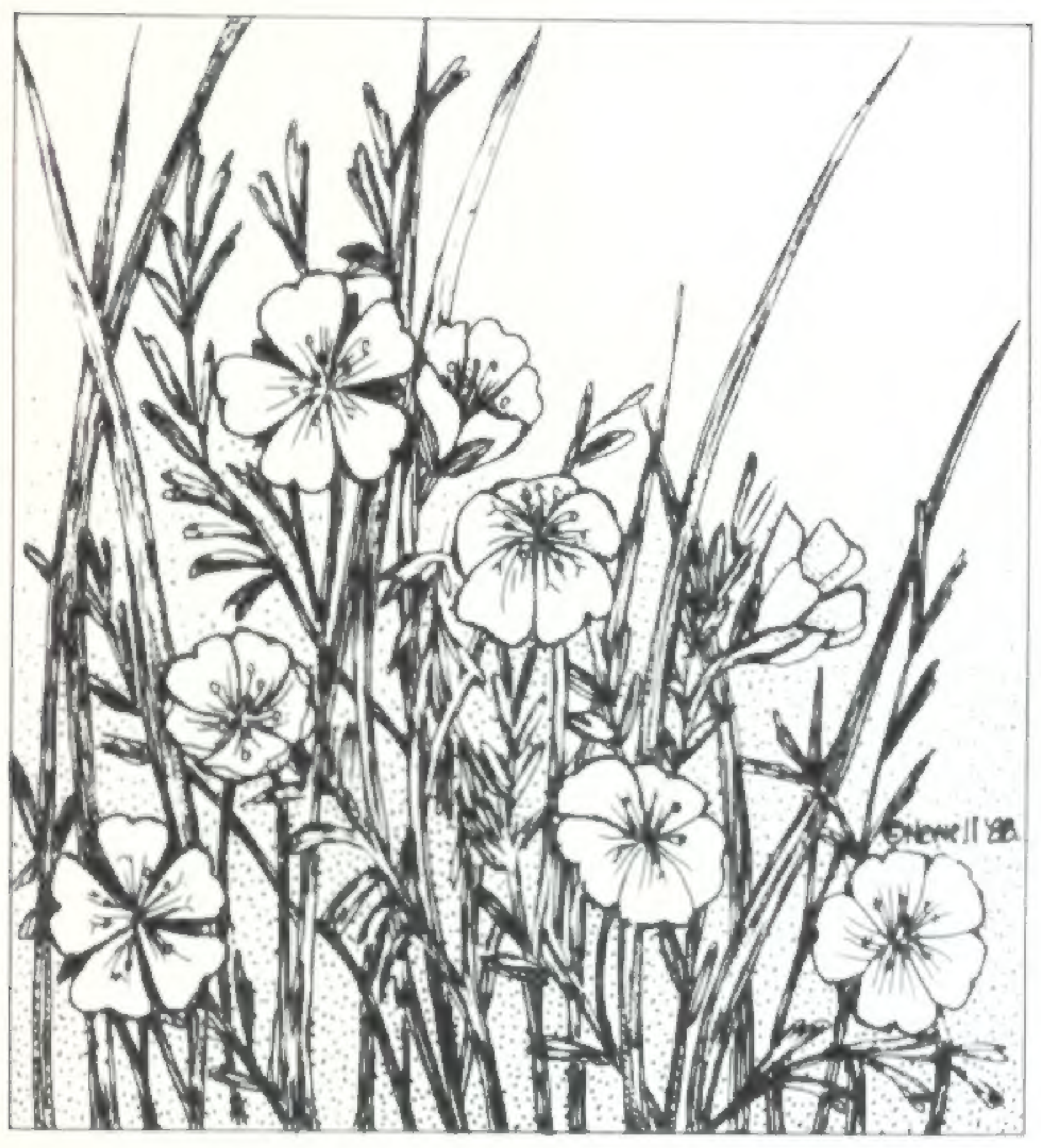
◀ *One of the nation's rarest orchids is the small* ***whorled pogonia****,* Isotria medeoloides*. Although widely distributed throughout the Northeast, it is found in only very small numbers wherever it grows.*

"We may think we can ignore the loss of this diversity, but it is the key to the survival of agriculture to support 10 billion people in the next century." *—Peter H. Raven*



Participating Institutions of the Center for Plant Conservation:

1) The Berry Botanic Garden
2) University of California Botanical Garden
3) Rancho Santa Ana Botanic Garden
4) Red Butte Gardens and Arboretum
5) Desert Botanical Garden
6) The Arboretum at Flagstaff
7) Denver Botanic Gardens
8) The Nebraska Statewide Arboretum
9) Missouri Botanical Garden
10) The Holden Arboretum
11) The New York Botanical Garden
12) Garden in the Woods
13) The Arnold Arboretum of Harvard University
14) The North Carolina Botanical Garden
15) Bok Tower Gardens
16) Fairchild Tropical Garden
17) Mercer Arboretum
18) San Antonio Botanical Garden
19) National Tropical Botanical Garden
20) Waimea Arboretum and Botanical Garden



MARY NEWELL DEPALMA

◀

Nine rare kinds of ***meadowfoam*** *of the genus* Limnanthes *are found only on the West Coast. Meadowfoams are a promising source for high-quality industrial oils found in their seeds.*

tions are complementary, and will enhance and assist each other. The Center is already developing an active program of applied rare plant research aimed at solving problems for land management agencies and increasing knowledge about uses and propagation of endangered plants. The Garden, with its international research program, has strong ties to the academic community and conservation organizations worldwide.

Both institutions are leaders in the creation of plant information systems and computer databases. The Center maintains BG-BASE, one of the most extensive databases on rare U.S. plants, and has developed information management systems in use at botanical institutions around the world. The Garden's TROPICOS system is in use to coordinate research in North and South America, Asia, and Africa. The combined computer capabilities will provide unmatched service to the field of conservation.

In addition, the collaboration will increase the opportunities for public awareness and education about plant conservation. As the economic uses of endangered species become increasingly important, the need for informed public support will increase. The Garden and the Center will provide a resource of unsurpassed expertise on these issues.

The cooperative agreement between the Garden and the CPC will increase the efficiency and effectiveness of plant conservation nationally and abroad. It will also benefit each institution.

The CPC will remain a separately chartered organization with its own Board of Trustees and by-laws. The Garden will provide an umbrella of support resources including offices, technical support, personnel, accounting, development, education and communications. The move to St. Louis will help the Center to concentrate its resources on its conservation programs, rather than on supporting a separate organization. The Garden's international research program and its role as headquarters for the Flora of North America will be enhanced by the Center's strong national program.

Dr. Peter H. Raven, director of the Garden, said, "We have participated with the CPC's conservation program since 1984 and are delighted they now will be a part of the Garden." ■

RICHARD BENKOF

The Flora of North America Editorial Committee met at the Garden October 7 and 8 to discuss progress on Volume I, publication of which is expected in late 1991. Pictured, front row, left to right: Rahmona Thompson, George Argus, Luc Brouillet, Leila Shultz, David Whetstone, Nancy Morin, Robert Kiger. Back row, left to right: Marshall Johnston, John Packer, Alan Smith, John Thieret, Richard Spellenberg, Ronald Hartman, Theodore Barkley, John Strother, David Boufford, Gerald Straley, and Grady Webster.

The Flora of North America Project

The Flora of North America project is a collaborative, bi-national effort of more than 20 major botanical institutions to compile the first comprehensive description of all plants growing spontaneously in the United States and Canada. The Missouri Botanical Garden serves as the organizational center.

Twelve volumes will be published over 12 years by Oxford University Press. In addition, all the information will be contained in a computerized data base, called TROPICOS. The database will be constantly updated and maintained as a permanent resource. The Flora will be useful not only to scientists but also for practical use and general reference in biology, conservation, wildlife management, forestry, horticulture, environmental sciences, and agriculture.

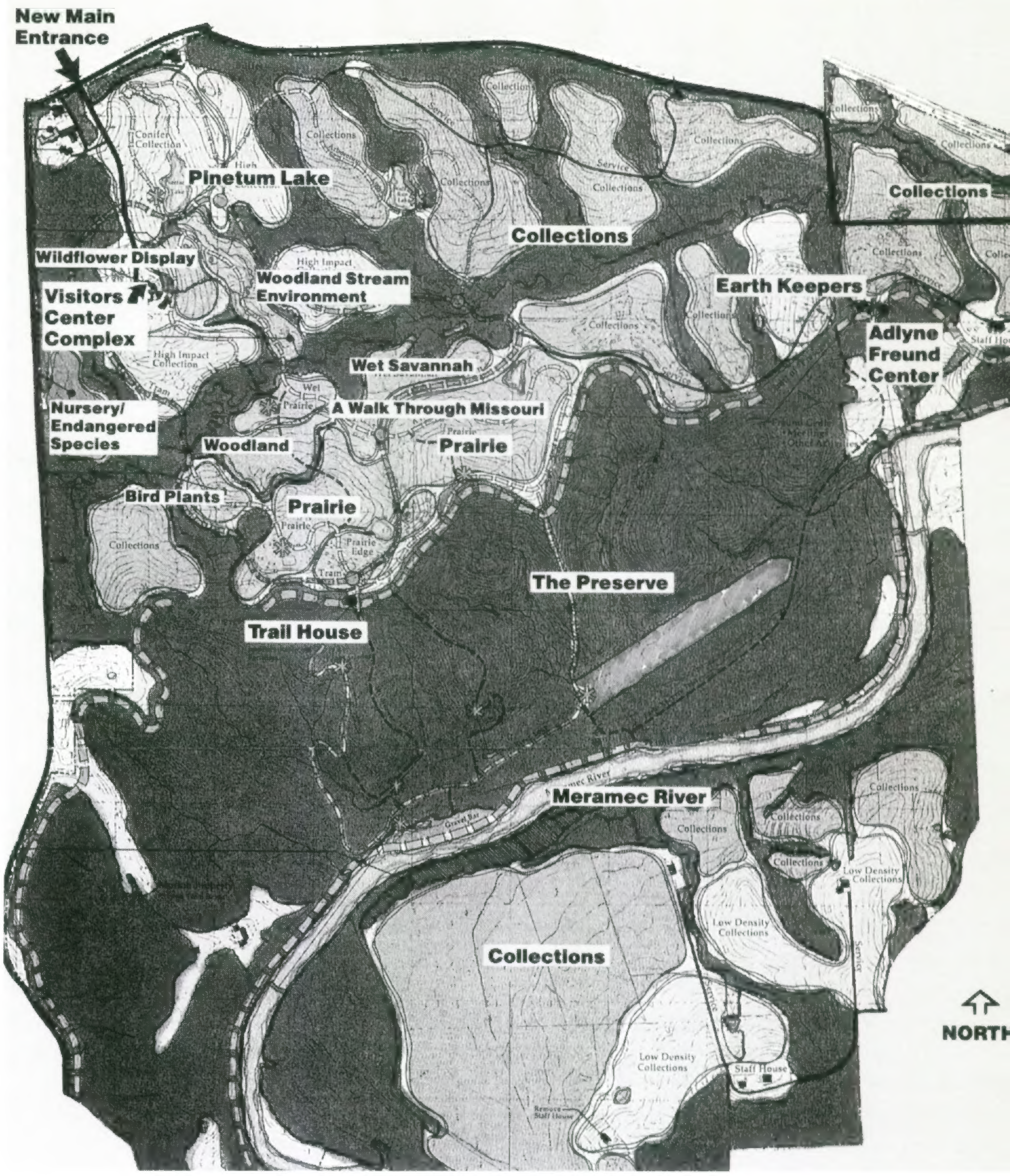
In order to identify a plant species as endangered, conservation groups, such as the Center for Plant Conservation, The Nature Conservancy, and others, require reliable and thorough information about that species. It is crucial that one reference be available as a landmark, a common point of reference, and the Flora of North America will fill this need.

The project will draw on the expertise of botanists throughout the world. The Flora will be written and reviewed by a large segment of the systematic botanical community and will draw on all of its resources.

The Flora of North America project has thus far received major funding from the National Science Foundation, the Pew Charitable Trusts, the David and Lucille Packard Foundation, the Chase Garvey Foundation, the Hewlett Foundation, and the National Fish and Wildlife Foundation. It continues to seek funds.

Arboretum Master Plan Is Unveiled

Changes over the years will preserve the natural, unspoiled beauty of the site.



THIS PAST FALL the Garden's Board of Trustees approved a detailed Master Plan for the future development of Shaw Arboretum, capping a two-year effort by Garden and Arboretum staff with the assistance of Environmental Planning and Design (EPD) of Pittsburgh, Pennsylvania. ''We are very excited about the prospect of increasing the educational and scientific opportunities at the Arboretum,'' said Dr. Peter H. Raven, director of the Garden. ''At the same time we are committed to preserving the natural beauty and integrity of the site.''

The plan is a series of flexible guidelines for gradual development over the next five to ten years. Attendance over the next 20 years is expected to reach 200,000 visitors per year, and education enrollments will double. To accommodate these demands and increase visitors' enjoyment of the Arboretum, improvements to existing facilities are of vital importance.

EPD under took a thorough analysis of the use of land at the Arboretum and in the surrounding areas. Prospects for future growth in adjacent highways, business and industrial developments were considered. All improvements were planned to enhance, not alter, the natural beauty of the site.

All existing structures will be utilized to keep costs down and reduce the environmental impact of new construction. Energy efficiency will be stressed.

Exhibits and Education The ultimate goal of all improvements will be to further the Arboretum's mission of educating visitors about the plants, animals, and ecosystems of the region. Three major zones in the Arboretum will play a part: the Preserve, the Environmental Exhibits, and the Collections.

Preserve The Preserve is already well developed with trails. It includes all the areas in the Meramec River landscape—the oak-hickory woods, limestone cliffs, glades, floodplain forest and the gravel bars. Development in the Preserve will be limited to improvements in the trail system and interpretive materials.

The Arboretum will also preserve single plants as a participant in the program of the Center for Plant Conservation. If it is appropriate, additional populations of a particular plant might be established in environments in the Arboretum open to the public.

Environmental Exhibits The Environmental Exhibits form the bridge between the Preserve, which is maintained as a natural area, and the Collections, which are horticultural. Because the Preserve will not have introduced plants, environments such as the prairie, which do not occur naturally on this site, need to be shown elsewhere. The Environmental Exhibits will be a mosaic of Missouri environments such as the prairie, a woodland stream, or a wet savannah, where plants of Missouri and the region can be planted and featured.

Within the Environmental Exhibit area will be plantings selected to attract wildlife, and in particular, birds and butterflies. These, once again, would not be developed as discrete intensive gardens, but rather as part of broader landscapes located and interpreted along a part of the path system.

One Environmental Exhibit that will be garden-like in design is the Wildflower area, located adjacent to the proposed Visitor Center Complex. This exhibit will incorporate a variety of environments in order to grow a complete range of herbaceous plant species, including wetland, shade and glade prairie environments. The Wildflower Garden has been made possible by a family gift from Mr. and Mrs. Blanton J. Whitmire.

Collections An important purpose of the Arboretum is to have collections of trees and shrubs hardy in the St. Louis area, complementary to the collections of the Garden and Tower Grove Park. Careful attention will be given to collecting plants from areas with similar climatic and environmental conditions and to collect them from known native sources. The decision to collect any particular plants will be coordinated with other arboreta to coordinate collecting efforts and avoid duplication. The emphasis will be on collecting species and developing genetically adequate samples. A very select number of cultivars might also be included when appropriate.

Some ''high impact'' collections will be featured for their unusual ornamental interest, and will be clustered around the main public paths and roads. Other collections will be of scientific interest and will not be accessible to the general public.

Education The number of students served by the Arboretum will probably double in the next twenty years. Education focusing on the natural world will continue to be emphasized, and the proposed improvements will greatly enhance the Arboretum's programs. The new Earth Keeper overnight education facility will consist of a series of log buildings adjacent to the existing Adlyne Freund Education Center, and will provide a site for a variety of overnight classes.

Conceptual Master Plan A new entrance will be constructed to the west of the present entrance to alleviate traffic congestion and provide access to the new Visitors Center Complex at the Brick House site (see map). Eventually there will be parking for 300 cars and five busses, to be constructed as needed.

The Visitors Center will be located between the collections and the environmental exhibits and will provide equal access to both areas. The ridge that separates the Brush Creek valley from the Meramec valley marks the end of the environmental exhibits and the beginning of the Preserve, which encompasses all the steep wooded land that runs down to the Meramec. Most of the activity will be concentrated on the western side of the site. The eastern portion of the site, which becomes progressively more remote, is reserved for other collections, some Preserve in the Meramec valley, and the Earth Keepers facility, which needs some isolation from the public areas.

The different areas are tied together by the existing loop road, which will serve as a tour vehicle route, and by a series of pedestrian loop trails that will emanate from the Visitors Center.

The general layout preserves the existing forested areas and takes advantage of open fields for exhibits between these areas. Surrounding the site is a minimum one hundred foot buffer of woods. The buffer and the natural tree cover in the valleys are connected by a network of woods throughout the site to provide animal corridors for small animals and birds, and to leave a framework within which plants and environmental exhibits can be displayed.

The area to the south of the Meramec River will be closed to the public. As the need arises, the land can be used for tree collections, being careful to preserve the pastoral qualities of the long views from across the river.

Visitors Center Complex The Visitors Center Complex is laid out around the historic Brick House which will continue to dominate the site and set the tone for future development. The new buildings are arranged to take full advantage of the wonderful long sweeping views into the interior of the site.

The group of buildings consists of the Brick House; a Reception Center; the main Visitor Center; and a picnic shelter. The buildings will be of stone and wood and the detailing will be simple and elegant and of the same high quality as the Brick House.

The Brick House is to be repaired and then renovated in the

sitors inspect
e Brick House
ring a tour.

KING SCHOENFELD

Future displays will follow the natural plan of the Pinetum.

The Arboretum will remain a special place to enjoy and learn about nature.

early phases to include a ground floor meeting/reception space with period furnishings and an exhibit on historic farming practices and their effect on the land and the landscape. The upstairs will be closed to the public and used for offices for the Visitors Center operation.

Behind the Brick House will be the Reception Center. This building will resemble a carriage house in appearance and will contain the reception desk, the main restrooms, and an exhibit space. Visitors will enter this building and then will be directed out into the site or to the other buildings. The tour vehicle will stop in front of the Reception Center on the main turnaround. Creating the Reception Center as a separate building breaks up the total mass of the buildings and allows the construction of the Visitors Center Complex to occur in phases.

The main Visitors Center will be built into the hillside and oriented to take advantage of the major views out to the south and the Prairie in the far distance. The building is entered on the upper level and a main lobby is flanked by a gift shop and a small food service facility oriented to the view. The lower level contains a multi-purpose room and its support facilities and classrooms which open onto outdoor terraces and then to the fields beyond.

It is a main objective to design the Visitors Center to incorporate energy and water conserving features such as berming against the building, a solid north wall, suntraps and window walls to the south, natural venting through the roof, supplemental wood heat, compact fluorescent lighting, and water saving toilets.

The picnic shelter with restrooms is located conveniently adjacent to the parking lot, but well screened from it, and looks out over its own fields. During the week this will serve the needs of school groups, providing not only a place to picnic under cover, but also a place to run and blow off steam removed from the main visitors areas and within easy reach of the school busses.

> *"We will be able to pass on a greater understanding and appreciation of the natural world."* —*John Behrer, manager, Shaw Arboretum*

KING SCHOENFELD

Circulation Eventually, no cars will be allowed to circulate through the site as they do now. The Visitors Center Complex will be the main tour vehicle stop and the starting point for hiking trails. The existing loop road will become the main route through the site accommodating a tour vehicle, pedestrians, and service and emergency vehicles.

The trail system begins at the Visitors Center and is arranged into three major loops through the three different landscape types at the Arboretum. All the trail loops are designed with cut off trails to shorten the distances. There are regular spots to stop and sit and to pause and look out at the landscape.

The Preserve The Preserve includes all the steep wooded slopes of the Meramec valley and the bottomland forest along the river. The main loop trail through the Preserve will begin at the Trail House and follow the existing trails. It will traverse the glade on a new boardwalk, run through the floodplain by the ''landing field,'' and return to the Trail House along a portion of the Labadie Trace. There will be rustic benches near areas of interest: in the glades, at the gravel bar and the landing field, along the wildflower trail, and at the existing locations in the prairie and at the bluff overlook.

The Environmental Exhibits The Environmental Exhibits are located between the Collections and the Preserve, between the purely horticultural landscape and the untouched native landscape. Native Missouri plants from all over the state can be assembled in these environments for display and teaching purposes. The Walk Through Missouri loop trail will tie these exhibits together.

The Collections The Collections are located mostly at the north end of the property and also south of the Meramec. They are set up as a series of openings framed by native woods. The design of the Pinetum, the only presently existing collection, will serve as the prototype for the development of future plantings. They would be designed as groves of a single species around expanses of open field. Long views would be preserved and the spaciousness of the site respected.

Administration and Education Facilities Eventually the administration and educational offices and facilities will move to the existing Visitors Center building. The education department will take over the existing Visitors Center space for offices, and the basement below will be used for storage.

The Maintenance and Production Complex The maintenance and production facilities will remain in their present location, but with several major improvements to the production facilities to serve the collections in the future. A twelve acre site has been reserved along Robertsville Road for a nursery and for the maintenance of threatened and endangered plants from the Center for Plant Conservation program. This area will not be open to the public.

Utilities In all areas, the utilities will be upgraded to serve the new facilities. Care will be taken to minimize the environmental impact, with city water where available, underground electric and telephone lines, and up-to-date septic systems.

In order to make sure that newly planted trees survive periodic droughts, there must be irrigation water available before any area is planted. The Master Plan calls for quick coupler irrigation to be available in all the collection areas and the nursery. The irrigation system would use city water.

John Behrer, manager of the Arboretum, said, ''The idea is to have a guide for improvements as they are needed over time. We want to plan as well as we can to protect the natural balance and beauty of the Arboretum, while increasing the public's understanding and appreciation of the natural world.'' —*This report was edited, in large part, from a report compiled by Environmental Planning and Design.*

KING SCHOENFELD

The Climatron complex: the new Shoenberg Temperate House, the new Brookings Interpretive Center, and the renovated Climatron.

SUPPORT FOR EXCELLENCE

Capital Campaign Exceeds Goal

The Campaign for the Garden closed on December 31, 1990, having attained a total of more than $20.3 million. Through the campaign a number of Garden facilities were renovated, replaced, or constructed, most notably the Climatron, Shoenberg Temperate House, Brookings Interpretive Center on the Tropics, and William T. Kemper Center for Home Gardening.

Robert Kresko, the Campaign Chairman, extended the appreciation of the Board of Trustees to all participants: ''We are deeply grateful that the community has recognized the Garden's record of consistent achievement and has chosen to support that excellence in the future through the results of this drive. Every member of the Garden's family has our thanks for their help, but I would be remiss if I did not single out for special recognition the William T. Kemper Foundation; Harriet Spoehrer and Sydney Shoenberg of our Board; the Kresge Foundation; and the corporate members of the Civic Progress organization, especially the Monsanto Fund, Emerson Electric Company, Southwestern Bell Foundation, and the McDonnell Douglas corporate and personnel foundations.''

Peter Raven added, ''At a time when the national agenda has a heavy environmental emphasis, an enormous public demand has arisen for the kinds of expertise the Garden can offer. This Campaign has provided the physical facilities on which to build creative, quality public programs encouraging each of us to contribute to the solution of pressing problems.''

KING SCHOENFELD

Missouri Botanical Garden
William T. Kemper Center For Home Gardening

The William T. Kemper Center for Home Gardening.

KING SCHOENFELD

TEMPERATE HOUSE HONORED—The Shoenberg Temperate House (pictured above) received an award for its innovative design from the American Institute of Architects (AIA) Design Awards Competition at the AIA Central States Regional Conference in Kansas City, Missouri on October 12. The Temperate House and its companion structure, the Brookings Interpretive Center, were designed as part of the new Climatron complex by The Christner Partnership, Inc., of St. Louis.

Energy Landscaping

Recently I had to remove four large persimmon trees from the north side of my house. Planted too close to the house, they cracked the plaster wall and filled the gutter with leaves. Aesthetically, they were wonderful; functionally, they were a disaster. Had they been positioned on the south side shading the house, I would have kept them, but they were the wrong trees for the wrong place. In this case, screening against wind on the north side was more important than providing shade or creating privacy.

According to the American Association of Nurserymen, properly placed plantings can save 10, 30, or as much as 50 percent on your home energy bill. Shading in the summer and blocking cold winds in winter are important to energy-efficient planning for your home. I replaced those persimmons with Canadian hemlocks for energy efficiency, and here's why.

ENERGY LOSS

Heat gain and loss from your home can be controlled through careful selection and positioning of landscape plants. For those of us with leaky cracks around doors and windows, sealing the holes will help enormously. However, diverting the winds by planting trees and shrubs will decrease the air pressure difference between indoors and outdoors, decreasing the energy loss.

Heat is also gained or lost directly through the building materials of your house. Insulation and creating tight air spaces will help. But no matter what you do, there will always be some heat conduction just through the wood, brick and mortar. Plants properly placed in the landscape can reduce the temperature differences between inner and outer wall surfaces, reducing the net transfer of heat.

Similarly, direct sunlight hitting the roof and sides of the house, while beneficial in the winter, causes a great demand for cooling in summer. Trees and shrubs can provide the shade to retard this effect.

SUMMER LANDSCAPING

The first step to energy efficient landscaping is mapping your property in relationship to the sun's direction. In summer, the sun rises in the northeast and moves at a steep angle to an overhead position at mid-day. Most heat gain occurs when the sun is at a low angle in the morning, between 8 a.m. and 11 a.m. Fortunately, because of overnight cooling, the morning heat is not a significant factor.

After 11 a.m. the sun will deliver maximum heat to the southeast corner of the house. This is a good place to locate one or two medium to tall deciduous trees to intercept the radiation. Good choices would include white ash, red buckeye, Kentucky coffeetree, amur corktree, hackberry, European hornbeam, ironwood, basswood, cucumbertree, Norway maple, red maple, Japanese pagodatree, sourwood, tuliptree and Japanese zelkova.

Most people think of the south wall as the most susceptible to heat gain. However, around noon the summer sun is high in the sky. This means that the southern walls are not receiving a direct exposure to sunlight and the heat gain is much less that you might expect. In winter, when the sun's position is much lower on the horizon, the heat gain on the south wall is much greater than in the summer. Of course, in winter this is very desirable for warming the house.

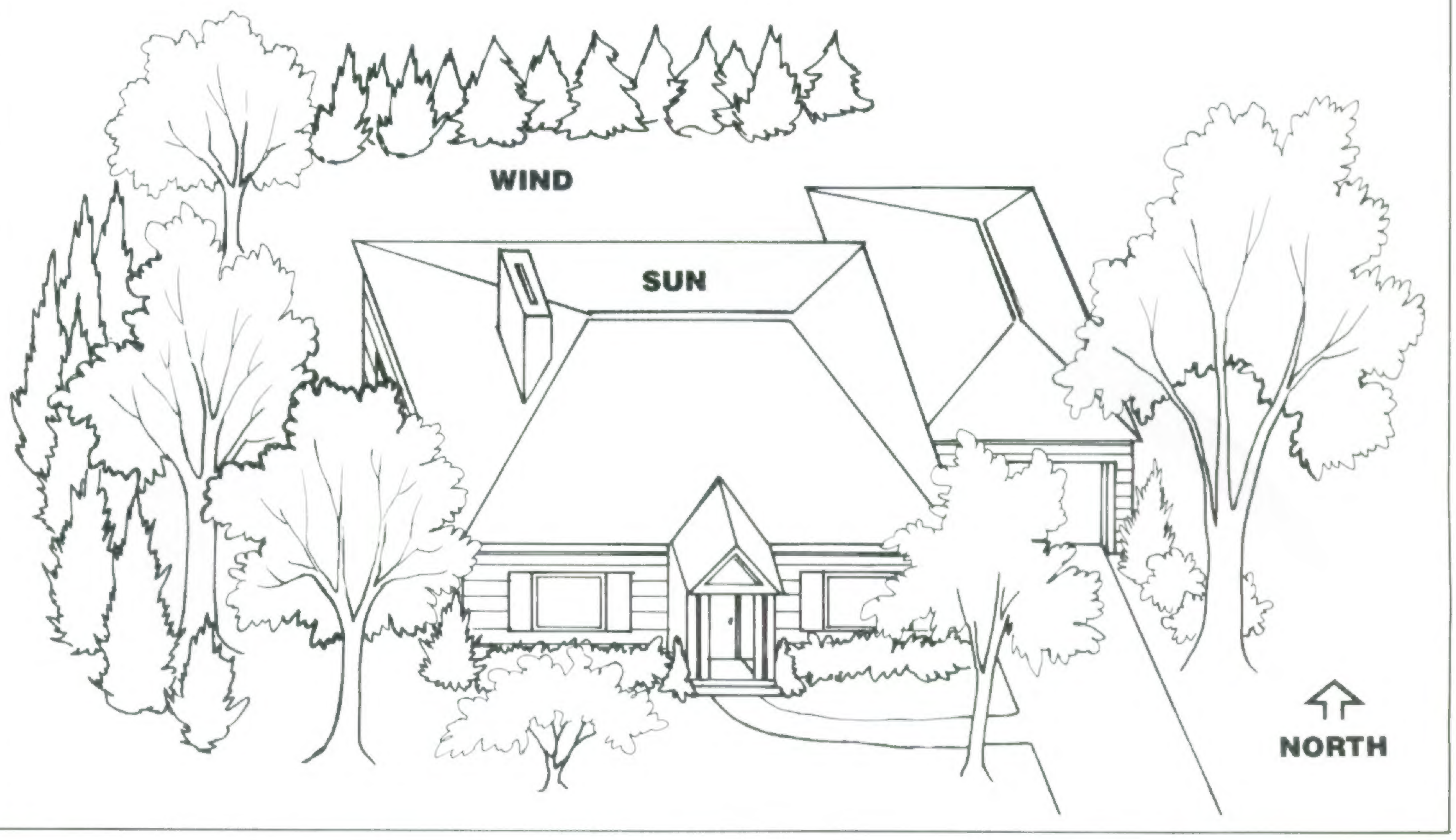
Overall, tall trees are not needed for shading southern walls. It might seem desirable to provide some shade for the roof in summer, but the angle of the summer sun is so great that tall trees would need to overhang the roof in order to do much good. This would present maintenance problems. The best plan would be to locate small trees and shrubs in the south exposure to cool the lawn areas and walks.

In early afternoon, around 1 to 2 p.m., the angle of the sun is lowering. This is the time when maximum heat gain can be expected on the southwest corner of the house. A couple of well positioned tall trees should be planted here to intercept the sun.

Because of the steep angle that the sun still maintains, you should choose a pyramidal to oval-shaped (taller than wide) tree, permitting it to be planted closer to the foundation to gain maximum shading of the wall and a portion of the roof. A tree growing tall and narrow is better than one growing tall and wide because of the potential for roof overhang and physically crowding the house. Good choices here include: ginkgo, goldenrain tree, ironwood, katsura tree, bald cypress, European larch, willow oak, sourgum, and tuliptree.

If there is one place to position plants, it is on the west side where the sun hits the house in the late afternoon. As the afternoon proceeds, the sun will reach maximum heating capacity between 3 and 5 p.m. The angle is as low as the morning sun, but the outside air is hot, offsetting the cooling effects of the night.

Ideally, you should plant a series of medium-sized evergreen trees about 25 feet away from the outside wall. You might choose Austrian pine,



shortleaf pine, white pine, Norway or blue spruce. Closer to the foundation, plant a deciduous or evergreen hedge to intercept the low angle rays and create a boundary of cool air shaded by the trees. As an alternative, you could construct a wire or wooden trellis positioned slightly away from the wall and grow deciduous vines like clematis, grapes and climbing roses. Creating a space away from the wall allows for air circulation, reducing humidity and moisture which will destroy paint and mortar. Plants such as English ivy, Boston ivy, Virginia creeper or euonymous will climb the wall by themselves, but the moisture and lack of air will cause physical deterioration of the wall. These evergreen vines should only be used where shade and screening is desired all year long, such as on a north wall.

Few people think of the air conditioner as a place for plants. A tremendous amount of heat needs to dissipate from the outside unit, assisted by the fan. Using plants to shade the unit will aid the conditioner's cooling capacity and prolong the life of the compressor.

Construct a trellis for evergreen vines over the unit leaving the sides open. Planting small trees and shrubs to produce shade will do the same thing. Most often the air conditioner is located on the north side, close to the house. Planting evergreen trees and shrubs will provide shade in summer and will screen the unit from view and give north wind protection during winter.

WINTER LANDSCAPING

There are two important landscaping energy strategies to be considered for winter. One is to allow as much solar radiation to reach the building as possible and the other is to screen cold winds. During this time, there is little sun to reach the east and west walls. Therefore, the trees that you planted to screen the summer sun on the south side should allow winter sun to shine through. This is why deciduous trees are recommended. Choose the trees with the fewest branches and those which lose their leaves early. Pin oak and shingle oak trees would not be good choices, as they frequently retain their leaves into the winter months.

Cold winds present the greatest challenge to energy savings in winter. In our area the winter winds come from the west and north. Windbreaks positioned perpendicular to the prevailing wind can reduce wind velocity by up to 20 percent and give a zone of protection extending well beyond the screen. Windbreaks should be located about 40 to 50 feet from the foundation of a one-story home to divert the wind up and over the roof line. Evergreen plants are ideal for windbreaks on the north and west sides, planted in a series of staggered rows to create density. If you prefer deciduous plants, choose species with a dense branching pattern that extends to the ground, and plant them in groups.

A second strategy to reduce heat loss in winter is to nestle the foundation with shrubs. This creates a dead air space between the plants and the walls, reducing the loss of heat much the same way thermal windows function. Again, the prime choice is to use evergreen shrubs that provide this benefit all year long. You might consider red cedar, white cedar or American arborvitae, Japanese holly, mugo pine, bird's nest spruce or yews.

Overall, landscaping for energy-efficiency makes good sense. Analyzing the property and strategically placing plants pay off in conservation of energy resources and lower energy bills all year round.

—Steven D. Cline, Ph.D.

Timely Tips from the Answer Service

Do you have a plant question? Call the Horticultural Answer Service, Monday through Friday, 9 a.m. to noon, at ***577-5143.***

January Tips

■ Old Christmas trees can be recycled in a number of ways. Limbs can be removed and laid over garden perennials or bulb beds to serve as an insulating mulch. The whole tree can be placed outside in the garden to serve as a sheltered roost for birds. Decorating the tree with seed-impregnated suet cakes or garlands of popcorn or other fruits will further enhance its value to wildlife.

■ Before purchasing fresh garden seeds, run a germination test to determine the viability of older seeds. Roll about 20 seeds in a damp paper towel, place in a plastic bag and keep warm. Check in a week. If less than half of the seeds sprout, buy fresh stock to ensure success.

■ Many houseplants suffer from low humidity levels indoors during winter. Avoid locating plants near heat ducts, radiators or fireplaces. Grouping plants close together helps elevate local humidity. Pots can also be placed on trays of moist gravel. Keep water on the gravel, but lower than the bottoms of the pots.

■ Calcium chloride should be used in place of sodium chloride to melt driveway and sidewalk ice. Sodium salts can severely damage ornamentals if they migrate into the root zones of these plants.

■ Fireplace ashes can be applied sparingly to lawns or vegetable and annual beds. Do not apply ashes to acid-loving plants such as azaleas and hollies. Heavy use of wood ashes will raise soil pH and is only recommended for soils testing acid in a pH test.

■ Check garden plants for "heaving" during thaws. Plants whose roots become exposed should be carefully pressed back into the soil before damage can occur.

February Tips

■ Take advantage of warm spells. If the soil is dry enough to work, prepare a row or two in the vegetable garden for the first crops of peas and spinach to be planted later this spring.

■ Fruit trees and deciduous ornamental trees can be pruned in February. Apply dormant oil sprays to control mites, aphids and scale. Oils are best applied on calm, windless days when the temperatures are expected to remain above freezing for 24 hours. Apply oil sprays before buds break dormancy and show color.

■ Seeds of hardy annual flowers such as larkspurs, shirley poppies, cornflowers, California poppies and cleome can be sown outdoors in late February.

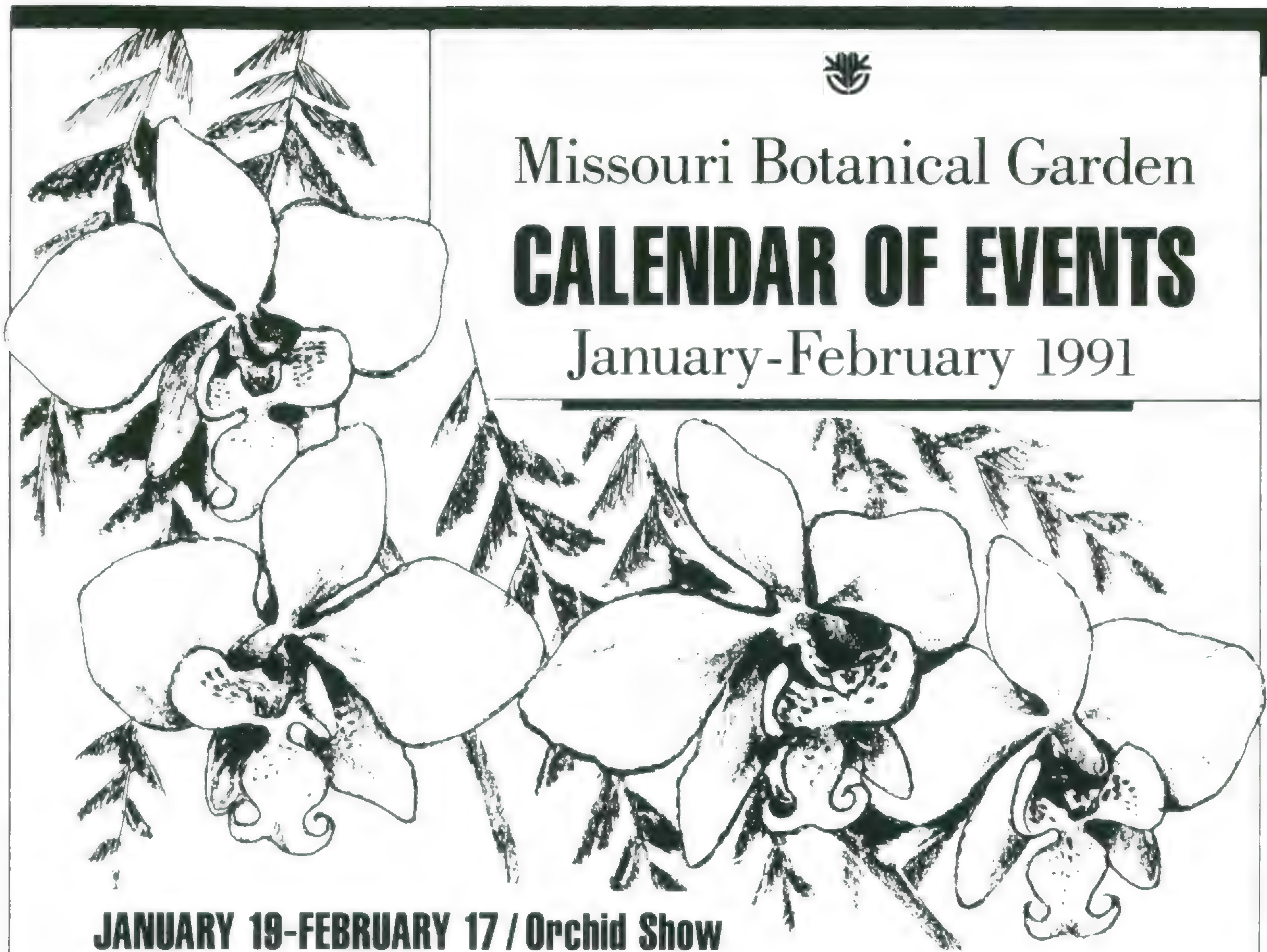
■ For an interesting addition to a windowsill herb garden, purchase a plump ginger root from the produce section of a grocery store. Plant the root just under the surface of a well-drained soil mix in an 8 inch pot. Grow on a warm, sunny window sill. Keep slightly damp until shoots appear, then water and fertilize regularly. Harvest the root when the shoots die next fall.

—Chip Tynan, The Answer Service

Missouri Botanical Garden

CALENDAR OF EVENTS

January-February 1991



JANUARY 19-FEBRUARY 17 / Orchid Show

9 a.m. to 5 p.m. daily, Orthwein Floral Display Hall. The tropics of Central and South America come to the Garden. Enjoy a stroll through a shady courtyard colonnade filled with a profusion of colorful tropical palms, ferns, ficus trees, crotons, and a display of an astonishing variety of epiphytic and terrestrial orchids including Cattleyas, Dendrobiums, Vandas, Phalaenopsis, and Oncidiums in a blaze of mid-winter color. Free with regular Garden admission. *Members' Preview—see January 18.*

JANUARY 22 / Members' Day ''Conservation—A Global Perspective''

2 p.m., Shoenberg Auditorium. A lecture by Dr. Peter H. Raven, director of the Garden. Free, for members only. Limited seating.

FEBRUARY 19 / Members' Day ''Spring Gardening''

1:30 and 7:30, Shoenberg Auditorium. A lecture by Julie Minner, co-owner of Minner Nursery, on preparing the garden with an emphasis on perennials. Free, for members only. Limited seating.

GARDEN WALKERS BREAKFAST

Every Wednesday and Saturday
7 a.m. to 10:30 a.m.

The popular Garden Walkers Breakfast program continues with the Garden opening early on Wednesday and Saturday mornings. The mileage of various paths around the grounds will be available at the ticket counter. Health and nutrition programs will be offered in cooperation with the American Heart Association. The Gardenview Restaurant will offer its ''heart healthy'' breakfast buffet of cereals, fruit, juice, and yogurt. (Coffee only will be available Wednesday, January 9.) The greenhouses will not open until regular opening hours at 9:00 a.m. Admission is free before noon every Wednesday and Saturday.

WALKING TOURS

Every Tuesday, Saturday and Sunday 1:00 p.m.

Join the Garden Guides for a tour of the grounds, featuring the art, architecture, history and horticulture of the Garden. Meet at the ticket counter in the Ridgway Center. Free with regular Garden admission.

JANUARY

3&4 THURSDAY & FRIDAY

Garden Gate Shop Is Closed For Inventory

Shop will reopen at 9 a.m. Satu
January 5.

7&8 MONDAY & TUESDAY

January Clearance Sale

9 a.m. to 5 p.m., Garden Gate Shop. Members receive 20% o everything in the Shop, includin clearance merchandise.

7-11 MONDAY-FRIDAY

Gardenview Restaurant Is Closed

Restaurant will reopen on Satur
January 12.

18 FRIDAY

Members' Preview of Orchid Show

5 to 8 p.m., Ridgway Center. Brighten up a cold winter evenin with a colorful trip to the tropics Entertainment, cash bar. Dinne buffet available in Gardenview R taurant. Garden Gate Shop will open. For Members only.

Orchid Sale

5 p.m. to 8 p.m. January 18; 9 a. to 5 p.m. daily through Februar Garden Gate Shop. Members receive 20% off all orchid plants accessories.

19 SATURDAY

Missouri Wildlife Artists Exhibition

9 a.m. to 5 p.m. daily through S day, February 17, Ridgway Cent Wildlife and nature paintings and sculpture by members of the Mi souri Wildlife Artists Society. Fr with regular Garden admission.

EBRUARY

SATURDAY

**ouri Wildlife Artists Society
nstration Day**

p.m., Ridgway Center. Join
of Missouri's finest artists as
emonstrate techniques of oil
atercolor painting and wood-
g. Raptor Rehabilitation and
gation Project will provide
is as models. Free with regu-
rden admission.

SUNDAY

**is Is a Lady's Slipper,
e's the Prince?"**

p.m., Ridgway Center and
tron. A day for children to
about orchids and other tropi-
nts in a variety of fun-filled
ies. Tours of the Climatron
rchid Show just for kids, led
dents of the Henry Shaw
my. Each participant will
e an Orchids coloring book.
vith regular Garden
sion.

WEDNESDAY

Seminar

.m., Botanical Room, Ridg-
enter. An informal way to
about gift planning through
e and discussion with estate
ng experts. Free, but reserva-
re required: call 577-9532.

ior League Presents
St. Louis Flower Show

riends and members of the Garden
ook forward to a wonderful display of
erica's Gardens: Then and Now,'' at
unior League of St. Louis national
er show January 31 through February
he Kiel Exposition Hall. The show is
sored by the St. Louis Convention
Visitors Commission, and will feature
ays and seminars led by noted
rts.

he Garden will participate with an
ational exhibit featuring the Center
Iome Gardening. Horticulture staff
master gardeners will be on hand at
mes to answer questions. Dr. Mar-
Crosby, assistant director, will speak
Shaw's Garden Then and Now,'' and
s Henrich, acting director of hor-
ure, will discuss ''The Iris Family''.
h for more information, or call the
r League at 997-3407 or 569-3117.

FEBRUARY

Black History Month—''On Road to the Dream''

The Garden hosts a series of programs in celebration of the history and accomplishments of African-Americans. February events include:

3 SUNDAY

''Celebrate the Gospel''

2 to 5 p.m., Shoenberg Auditorium and Ridgway Center. Gospel choirs from the St. Louis area perform music by African-American artists. Musical selections feature a range from early familiar pieces to recent contemporary works. Free with regular Garden admission.

9 SATURDAY

Children's Day

1 to 4 p.m., Ridgway Center. A day of storytelling and crafts workshops will celebrate the legacy of African-Americans in science and agriculture. Co-sponsored by the Girl Scout Council of Greater St. Louis. Free with regular Garden admission.

24 SUNDAY

Community Beautification Awards Reception

6:30 p.m., Ridgway Center. The Garden will honor members of the African-American community who have made significant contributions to efforts to beautify area neighborhoods. By invitation only.

27 WEDNESDAY

Lecture: ''Ntozake Shange and Syllable''

7 p.m., Shoenberg Auditorium. A distinguished poet, playwright and novelist, Ntozake Shange is one of America's most lyrical black voices and a major force in American fiction. She is the author of the critically acclaimed Broadway play ''For Colored Girls Who Have Considered Suicide/When the Rainbow Is Enuf''. An autograph session and reception will follow the lecture, which focuses on the power of language. $3.50 members, $4 non-members. Tickets available at Ridgway Center beginning Monday, February 11.

From the Garden Gate Shop

Shop Closed for Inventory

The Garden Gate Shop will be closed for inventory Thursday and Friday, January 3 and 4, and will reopen at 9 a.m. Saturday, January 5.

January Clearance Sale

Monday and Tuesday
January 7 and 8, 1991
9 a.m. to 5 p.m.

Bonus savings! Members receive 20% off everything in the Shop, plus a selection of clearance items, during the sale.

Orchid Show and Sale

The annual Orchid Sale kicks off with the members' preview of the 1991 Orchid Show on Friday evening, January 18, and continues until February 24. Members receive 20% off all orchids, orchid bark and fertilizer, and wire accessories.

Valentine's Day

Remember your sweetheart with a colorful blooming plant or one of our charming collection of romantic gifts and cards. The Tower Grove Rose, specially created for the Garden by the Boehm Porcelain Studios, says you care all year long. It is exclusive to the Garden Gate Shop, $175.

Remember Feathered Friends In Winter

Don't forget that the Garden Gate Shop has a wide variety of bird feeders, bird houses, bird seed and bird books, tapes and videotapes.

Plan Ahead For Spring

Pick up your seeds, windowsill greenhouses, peat pots and seed-starting accessories. The Shop is also featuring the ''Garden Planning Kit,'' a vegetable garden planner with a garden planning grid, 1800 reusable full-color peel and stick plants and complete garden planting instructions.

From the Membership Office

MEMBERS' TRAVEL PROGRAM

Lewis and Clark Trail Nature and History Tour

■ *JUNE 14-27, 1991*

"Travels through Natural History" invites you to follow in the footsteps of Lewis and Clark's famous "Corps of Discovery" expedition of 1803-06 along the Missouri River to the northwestern territories. The tour is sponsored by the Missouri Botanical Garden, University of St. Louis Continuing Education Program, and the U.S. Army Corps of Engineers. Dr. Nancy Morin and Dr. Marshall Crosby of the Garden, and Dr. Ray Breun of the Riverland Association are your tour hosts and lecturers. Highlights will include:

■ Orientation lecture and tour of the historic St. Louis and Old St. Charles locations where the expedition began.

■ Barge tour of the lower Missouri River.

■ Travel by motorcoach to Independence, Fort Osage and St. Joseph, Missouri, studying Indian history and the fur trade.

■ Travel to Fort Atkinson at the mouth of the Platte River. Continue to Pierre, South Dakota, and on to Bismarck, North Dakota, visiting the grave of Sitting Bull and a monument to Sacajawea. Lectures focus on the expedition's relationship with Indians.

■ Visit the restored Mandan Indian Village and museum and the expedition's 1804-05 winter quarters at Knife River Indian Villages.

■ Travel through the North Dakota Badlands to Fort Union Trading Post National Historic Site, and along the Yellowstone River to Billings, Montana.

■ The arid shortgrass prairie gives way to forests of ponderosa pine and douglas fir as you enter the Rockies and stop at the 128-year old Sacajawea Inn, an historic landmark on the banks of the Missouri Headwaters.

■ Travel by barge through the Gates of the Mountains, studying the changed environment and the spectacular scenery of the "Missouri Breaks" in the region near Great Falls, Montana.

■ Follow the expedition's path over the Bitterroot Range and Continental Divide, along the Lochsa, Clearwater and Snake River valleys, and back to arid prairie of the Nez Perce National Historic Park. Study the changing vegetation and the exploitation of the region based on the discoveries of Lewis and Clark.

■ Follow the Columbia River and the Willamette Valley to Portland. Turn north to Fort Vancouver and Mount St. Helens, staying at the lovely Shilo Inn at Seaside, Oregon, overlooking the Pacific.

■ Tour the historic sites of the area, including the expedition's restored winter quarters at Fort Clatsop with actors in living history displays, and Fort Canby, where Lewis and Clark actually reached their goal—the Pacific Ocean.

The tour returns to St. Louis by air from Portland. Two hours of optional graduate credit are available from U.M. St. Louis Continuing Education at an additional fee. Reservations are due by May 1, 1991. For a complete itinerary and information, call the Membership Office at (314) 577-9517.

Coming in 1991:

■ *A GARDEN TOUR OF CHINA—May 15-31, 1991*

Co-sponsored by the Garden and University of Missouri-St. Louis, this tour will be led by Juliana Yuan Burch, lecturer in Asian art history.

■ *MADAGASCAR—October 1991*

Watch your mail or call Brenda Banjak at 577-9517 for details on this exciting trip!

Flowers And Candy For Your Valentine

This Valentine's Day send a year of flowers with a Missouri Botanical Garden membership and a box of Fannie May Candy to your special valentine. Use the order form below or call 577-5118 to order your Valentine membership. Gift recipients in the St. Louis metropolitan area will receive your unique Valentine gift delivered to their doorstep on February 14th.

Gift Membership Order Form—*Please mail at least three weeks prior to occasion:*

☐ Valentine's Day ☐ Birthday ☐ Other____________

Gift to: (Please print) Name____________

Address____________

City____________State______Zip______

Gift from: Name____________

Address____________

City____________State______Zip______

Telephone____________

Please sign card:____________Date needed by:______

Regular membership: $40. Contributing membership $75.

☐ My check for $____________ is enclosed.

☐ Please charge: ☐ VISA ☐ MasterCard

Amount: $____________

Account No.____________

Name on card:____________

Expiration date:____________

Signed:____________

Detach and mail to: Missouri Botanical Garden
P.O. Box 17419
St. Louis, Missouri 63178

Call 577-5118 for more information.

EDUCATION DIVISION PLANS EXPEDITION

Amazon Rain Forest of Peru

■ *JULY 13-20, 1991*

The Amazon River Basin is a region of unequaled biological diversity, with some 3,000 species of birds, 4,000 species of butterflies, and 2,000 species of fish. This summer, an extraordinary travel experience led by Garden education staff will stimulate and educate participants about the natural wonders of the Earth and the vital role the Amazon plays in global ecology.

The river and jungle adventure will explore the rich Peruvian section of the Amazon River and surrounding river basin. Travelers will stay in secluded river lodges in the dense tropical rain forest. Local guides with extensive knowledge of the plants and animals indigenous to the Amazon will accompany the Garden group along rain forest trails and canoe journeys on the Amazon River and its tributaries. Expedition participants will also have opportunities to meet with natives of the region.

Anyone interested in participating in the trip should contact Glenn Kopp or Barbara Addelson, Missouri Botanical Garden Education Division, (314) 577-5140.

Travelers in the Amazon explore the River's natural beauty from dugout canoes.

Tropical Rain Forests Summer Workshop for Teachers

Once again the Garden is offering a summer workshop on the nature and value of tropical rain forests, the social and economic factors contributing to their destruction, and the methods for their preservation. The course will be held at the Garden, June 17-28, in ten sessions from 9 a.m. to noon.

The course is designed to prepare teachers of grades K-12 to teach about deforestation in their classrooms and will provide them with materials, strategies and resources. Two graduate or undergraduate credit hours in biology or education from the University of Missouri-St. Louis will be awarded upon completion. Instructors will be Garden staff and area specialists.

The workshop will correlate with the upcoming Smithsonian Institution Traveling Exhibition Service (SITES) exhibit, "Tropical Rain Forest: A Disappearing Treasure," which will be in St. Louis January 11-April 5, 1992. The workshop was originally developed through funding by a grant from the John D. and Catherine T. MacArthur Foundation.

For more information call 577-5140.

1991 Members' Days

The coming year features an exciting calendar of special monthly events just for Garden members.

January 22	"Conservation: A Global Perspective," lecture by Peter H. Raven
February 19	"Spring Gardening," lecture by Julie Minner
March 20	Hard Hat Tour of Center for Home Gardening
April 25	Azalea Walk
May 17	Purple Martin Evening
June 28	Members' Musical Evening
July 11	Moonlight Stroll
August 17	Early Morning Stroll
September 21	Fall Gardening Lecture
October 9	Fall Foliage/Cider Walk
November 14	Tour of the Greenhouses
December 14	ITC Theater

NEWS FROM THE HENRY SHAW ACADEMY

Henry Shaw Academy

Stream Ecology Program Studies Upper Meramec River

Last October a group of 13 and 14-year old students and their instructors explored the upper Meramec River on a chilly, exciting two-day float trip. The group traversed beaver dams and cold spring fed water, observing fish and wildlife, while collecting chemical samples and other data. Their information was used to help build a national database on rivers through the Missouri Department of Conservation Stream Team project, a nationally recognized environmental stream preservation program. Data also was furnished to TERC (Technology Education Resource Centers), an international global ecology database.

Stream Ecology is an innovative new program offered by the Henry Shaw Academy (HSA). It provides exceptional opportunities for 13-14 year olds interested in science, research, technology and adventure based in a canoeing and camping program. Classes held before and after the field trips demonstrate research methods, map reading, and analysis of data. The course will continue in the winter, spring and summer as the group researches the springs, caves and water life of the Meramec all the way to Onandaga Cave. In the future Stream Ecology will research additional rivers and streams throughout Missouri.

A limited number of spaces are still open for interested and committed students. Some scholarships may be available. The next field trip is January 5-6, 1991. To apply for the program call Jeff De Pew, HSA Coordinator, 577-5135, as soon as possible.

RICHARD BENKOF

Pictured at the Henry Shaw Dinner, left to right: Kenneth Piddington; Peter Raven; William Ruckelshaus; Robert Kresko, president of the Board of Trustees; and William Maritz.

William Ruckelshaus Receives Henry Shaw Medal

The Henry Shaw Medal for 1990 was awarded to William Doyle Ruckleshaus at the annual dinner on Thursday, October 25 at the Adam's Mark Hotel. William D. Maritz, chairman of the award committee and a Garden Trustee, presented the medal.

Mr. Ruckelshaus was honored as the first director of the Environmental Protection Agency, which he served in 1970-73 and again in 1983-84. In 1973 he was appointed acting director of the Federal Bureau of Investigation, and in the same year was named Deputy Attorney General of the United States. Today he is chairman and chief executive officer of Browning-Ferris Industries, Inc. of Houston, Texas, one of the nation's largest waste disposal companies. He also serves on the board of the Conservation Foundation/World Wildlife Fund. He writes and speaks often on the challenge of formulating policies that promote sustainable development in a world of limited resources.

Also speaking at the dinner was Kenneth Piddington, director of the Environmental Department of the World Bank. A slide presentation on the Garden's role in the global environmental movement, prepared with the aid of Maritz, Inc., was another highlight of the evening.

Daylily Society Honors Ed and Mary Schnarr

The West County Daylily Society has presented the Garden with $7,000 raised from the sale of divisions of plants from the Jenkins Daylily Garden. The donation was made in honor of Ed and Mary Schnarr, whose dedication and devotion made the display what it is today.

The Schnarrs volunteered their services at the Garden for many years, and Ed is a past president of the Daylily Society. They were instrumental in planning the Jenkins Daylily Garden's planting scheme and in acquiring all of the plants through donations or purchases. Together with the members of the Society, the Schnarrs gave countless hours of care and attention to the planting and care of the display.

A plaque will be installed in the south end of the Daylily Garden commemorating the Schnarrs' achievement. The surrounding plantings will feature daylilies produced by Missouri hybridizers. The Garden is deeply grateful to Mr. and Mrs. Schnarr and the members of the Daylily Society for their splendid contribution.

Paul Brockmann: 20 Years at the Garden

CLIFF WILLIS

"Over the past 20 years the Garden has achieved the reputation as a forerunner in setting the standard for botanical garden excellence," says Paul Brockmann. He should know; Brockmann came to the Garden in 1970 and has participated in the changes as they occurred.

Paul joined the horticulture division under Alfred Saxdal in 1970 after earning his B.S. degree in forestry from the University of Missouri at Columbia. "The Lehmann Building was just starting construction," he remembers. "We still had a cord-and-plug switchboard for the telephones, and advanced technology was an adding machine. My job was pretty varied—mowing grass, digging the beds, planting, and repairing equipment."

In 1976 Dr. Raven appointed Brockmann as director of General Services. His responsibilities include safety, security, and maintenance of all Garden structures; he supervises shipping and receiving, and manages all Garden construction projects. It is a diverse job, with a variety of new learning experiences. "It has been to my advantage to be able to incorporate my engineering background with actual hands-on experience with the facilities here," he says.

In supervising the design and construction of all of the new buildings at the Garden, Brockmann works closely with the contractors and architects. "We probably are more demanding than many clients," he says, "but it pays off in the long run. We are constantly searching for the most beneficial blend of technology and ecological consciousness in order to preserve our commitment to excellence."

Paul pioneered the Garden's use of computers to schedule routine preventive maintenance. Staff productivity is also enhanced by Brockmann's insistence on using consistent, standardized equipment and utilities systems whenever possible. The historic buildings are a special challenge, and the Garden's archives are often consulted for original plans and specifications.

"Twenty years ago some of our brick maintenance sheds had dirt floors. A lot has changed, but we're still using a dump truck and a front end loader from the late 1960s," Paul points out. "Perhaps the most satisfying things about this job are the unique opportunities for learning and growth that arise out of the various demands of Garden daily life, and of course being able to see the beauty all our efforts help to create."

Trustee Profile

JOHN K. WALLACE

John K. Wallace first became interested in the Garden early in 1980 during the Ridgway Center capital campaign. As he became involved with the Garden, he was amazed to learn more about its mission and how much the Garden does beyond its displays. He found Garden efforts in tropical research astounding and exciting.

Mr. Wallace joined the Board of Trustees in 1982. "I became committed to help the Garden in whatever way I could. It is so much more than an attractive place to visit," he said.

Serving presently as an officer on the Board of Trustees, Mr. Wallace commented that the greatest challenge during his nearly ten years of service has been his role in the recent capital drive. "As Chairman of the Special Gifts Committee, I have been intimately involved in assisting in the development process and have found working with new prospects and presenting the Garden to them to be an extremely rewarding assignment. It is a delight to introduce people to the Garden and give them a better understanding of the Garden's entire mission."

In thinking about the Garden's future, Mr. Wallace said that while it is amazing how far the Garden has come in the last ten years, we must not be lulled by that progress because there is still much to be accomplished. "The institution is growing and at no time can the Trustees afford to be complacent. There will be many more challenges ahead as the Garden prepares for the year 2000."

A native St. Louisan, Mr. Wallace presently serves as Chairman and Chief Executive Officer of Imperial Products Corporation. His civic responsibilities beyond the Missouri Botanical Garden include serving as a Trustee at Washington University, and a Director at the St. Louis Municipal Opera. Wallace received his undergraduate degree from Yale and his Masters in Business Administration from Washington University. He and his wife Ellen have three children.

L. A. KELLY

On October 24 the Garden hosted a dinner in honor of Kwoh-Ting Li, senior economic advisor to the president of Taiwan, Republic of China. The Garden is collaborating with scientists on Taiwan in studies of biological diversity. Shown here, left to right, are Dr. Peter H. Raven, K.T. Li, and Mayor Vincent Schoemehl, a Garden Trustee.

Spink Gallery Adds New Sculptures

Mr. and Mrs. C. C. Johnson Spink recently presented the Garden with fifteen rare and exquisite pieces of Boehm porcelain sculpture to be added to the collection already on display in the Ridgway Center. Mr. and Mrs. Spink gave the gallery and presented the collection to the Garden in 1982 in memory of Blanche and Taylor Spink.

The new acquisitions include an intricate orchid centerpiece and a Bald Eagle once owned by President John F. Kennedy. The Spink Gallery is one of the world's finest exhibits of birds, flowers and fish from the Boehm Porcelain Studios.

MBG Calendar Receives Support

Mrs. William H. Schield of St. Louis has once again contributed generous financial support for the printing of the Garden's Calendar. A devoted member for many years, Mrs. Schield derives special pleasure from sharing the beauty of the Garden in a lasting way with friends in St. Louis and around the world.

The 1991 Garden Calendar is a breathtaking collection of large full color photographs by Jack Jennings that capture the Garden's landscape throughout the seasons. The calendar is available through the Garden Gate Shop. The Garden is deeply grateful to Mrs. Schield for continuing to make the popular Calendar possible.

IN MEMORIAM

Clifford E. Rhoads

One of the Garden's original Answer Man volunteers, Cliff Rhoads, died October 19, 1990 at the age of 95. Mr. Rhoads had been a volunteer at the Garden since 1955, and in 1986 he was honored for 40 years of service to the Garden. He was a member of the St. Louis Garden Club, a skilled cabinetmaker and a devoted, knowledgeable gardener. He helped to lay out and plant the rose garden, and in 1960 he helped to establish the Garden's Answer Service.

Mr. Rhoads served in the Army Air Service in World War I as a mechanic, and worked on the airplanes of Charles Lindbergh and James Doolittle when they were flying the mail into St. Louis. Later Mr. Rhoads became an automobile parts and service manager, retiring in the mid-1960s.

Gift Planning

New Seminar Series

A new series of seminars will be offered this spring in response to many requests. Gift planning concepts will be discussed in informational seminars that provide an informal and easy way to learn about gift planning ideas and techniques.

The first session will be an evening seminar on February 27, 1991 at 6:30 p.m. in the Botanical Room at the Ridgway Center. This session will cover the importance of a valid will and the steps necessary to ensure having one.

On April 4 there will be a morning session on the same topic at 9 a.m. in the Garden Room. This will be followed one week later on April 11, also at 9 a.m. in the Garden Room, with an expanded program about additional techniques that are available to make sound financial plans for the future. While the morning sessions are a two part series, it is not necessary to attend both.

The seminars are offered free of charge. However, a reservation must be made in advance to ensure seating and materials. For more information or to make reservations please call Ernestina Short at 577-9532, or write to her at P.O. Box 299, St. Louis, MO 63166-0299.

RICHARD BENKOF

On October 29 a dinner was held at Spink Pavilion to welcome a delegation from Nanjing, China, in honor of its sister city relationship with St. Louis. Pictured left to right are: Dr. Chingling Tai, Teng Heling, Jing Yuanhu, Dr. Peter Raven, Mayor Wang Rongbing, Song Peiming, and Wang Jianling.

L. A. KELLY

(Left to right) Antoine Solomon of the Guyanese Society of St. Louis is shown presenting a painting to Dr. Marshall Crosby, assistant director, and Dr. W. D. Stevens, manager of research. The painting depicts a typical Amerindian scene in the rain forest of Guyana, with the Mazaruni River in the foreground. It was presented to the Garden by the Guyanese Society of St. Louis on behalf of the mayor and citizens of Georgetown, Guyana, in celebration of their sister city relationship with St. Louis.

Pat Rich Is New Head of Arts and Education Council

Patricia E. Rich, former director of development at the Garden, was named president of the Arts and Education Council of Greater St. Louis, effective November 1, 1990. Rich was on the staff of the Garden for six years, first as special assistant to Dr. Raven, then as director of planning and development. In 1987 she formed her own management consulting firm, Patricia Rich Associates, specializing in fund raising and planning for nonprofit organizations, and continued to serve the Garden in addition to a number of St. Louis cultural institutions. Her projects for the Garden included overseeing the development of the membership program and the Ridgway Center.

The Arts and Education Council, formed in 1963, is a nonprofit association providing financial assistance to over 140 member organizations in the metropolitan area through an annual fund drive and the bi-annual CAMELOT auction.

"We congratulate Pat on her achievement and look forward to her continued contributions to the St. Louis cultural community," Dr. Raven said.

Raven Awarded Major Prizes For Environmental Work

Dr. Peter H. Raven, director of the Garden, has received three prestigious national and international scientific and environmental awards.

On November 9 the National Association of Biology Teachers (NABT) presented Raven with their Distinguished Service Award for major contributions to biology. The award was presented at the NABT 1990 convention in Houston.

On November 10 His Royal Highness, Prince Bernhard of the Netherlands, confirmed Raven as an Officer in the Order of the Royal Ark, a society established in 1971 to honor individuals for outstanding work in the preservation of nature.

On December 3 the Council of Scientific Society Presidents (CSSP) presented Raven with its 1990 Award for the Support of Science. The CSSP confers this award each year to honor ''an individual who merits recognition for dedicated support of science, free science communication, science research, and public understanding of science.'' The award was established in 1983. Past recipients include C. Everett Koop, Surgeon General of the United States; Roland W. Schmitt, Chairman of the National Science Board; William Carey, Executive Officer of the American Association of the Advancement of Science; and Erich Bloch, Director of the National Science Foundation.

Raven Serves on Panel for St. Francis Prize

The first International St. Francis Prize for the Environment was presented on October 20 in Assisi, Italy. Dr. Peter H. Raven served on the panel of 12 jurors making the awards, which are sponsored by the Franciscan Center of Environmental Studies in Rome and the Sacred Convent of St. Francis in Assisi. A 1987 papal proclamation named St. Francis the patron saint of ecologists.

The ''Canticle of All Creatures'' prize is awarded to persons or institutions that have distinguished themselves at the highest international level to the harmonious relations of human beings within their environment. The 1990 awards were presented to the National Geographic Society, and to Professors Maurice Aubert and Amintore Fanfani.

Moving? Please Remember To Send Us Your New Address.

To avoid missing any of your membership mailings, you *must* give us your new address at least three weeks *before* you move. Please enclose the mailing label on the back cover of this *Bulletin*, and mail to: Membership Office, Missouri Botanical Garden, P.O. Box 299, St. Louis, MO 63166.

Richardson Honored by University of Naples

Dr. P. Mick Richardson, manager of graduate studies at the Garden, was recognized as an ''Honorary Botanist'' by the Botanical Garden of the University of Naples, Italy, while participating in the 85th Congress of the Italian Botanical Society last October. Richardson was a visiting professor at the Botanical Garden in 1987-88.

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Forero Receives National Excellence Award

Dr. Enrique Forero, the Garden's director of research, has been awarded the National Excellence Award in Natural Sciences by the Alumni Association of the National University, Bogotá, Colombia, the most important center of higher education in the country. Dr. Forero received his undergraduate degree in botany from the National University in April of 1965 and went on to receive a Ph.D. degree from the City University of New York/New York Botanical Garden in 1972. He has been with the Missouri Botanical Garden since 1986. The National Excellence Awards were presented this year for the first time, and Dr. Forero was among twenty recipients that included a former President of Colombia and other outstanding personalities in science, education, the arts, engineering, medicine, and other fields.

Behind the Scenes

Robert Bowden Named Director of Atlanta Botanical Garden

Robert Bowden, former director of horticulture at the Garden, has been named executive director of the Atlanta Botanical Garden, effective January 1, 1991. Bowden came to St. Louis in 1988 from Old Westbury Gardens in Long Island, New York.

The Atlanta Botanical Garden is a 30-acre facility dedicated to display, education and research. It is considered one of the finest of a new generation of botanical gardens in the U.S., with a staff of 48 and nearly 9,000 members. Its new display facility, the Dorothy Chapman Fuqua Conservatory, drew 200,000 visitors last year.

As executive director, Bowden will supervise all operations, from plant collections to fundraising.

CLIFF WILLIS

Flocking To See the Sheep

A flock of lifelike sheep created by the noted French sculptor Francois-Xavier Lalanne has appeared on the grassy hills just south of the Center for Home Gardening site. The sculptures, crafted of bronze and epoxy stone, are grazing at the Garden on long term loan from the Greenberg Gallery of St. Louis. Persons interested in taking one home may call the Greenberg Gallery at (314) 361-7600.

''This art delights everyone, young and old,'' said Marshall Crosby, assistant director of the Garden. ''Lalanne's work brings warm smiles to visitors who happen upon the sheep while strolling through the Garden.''

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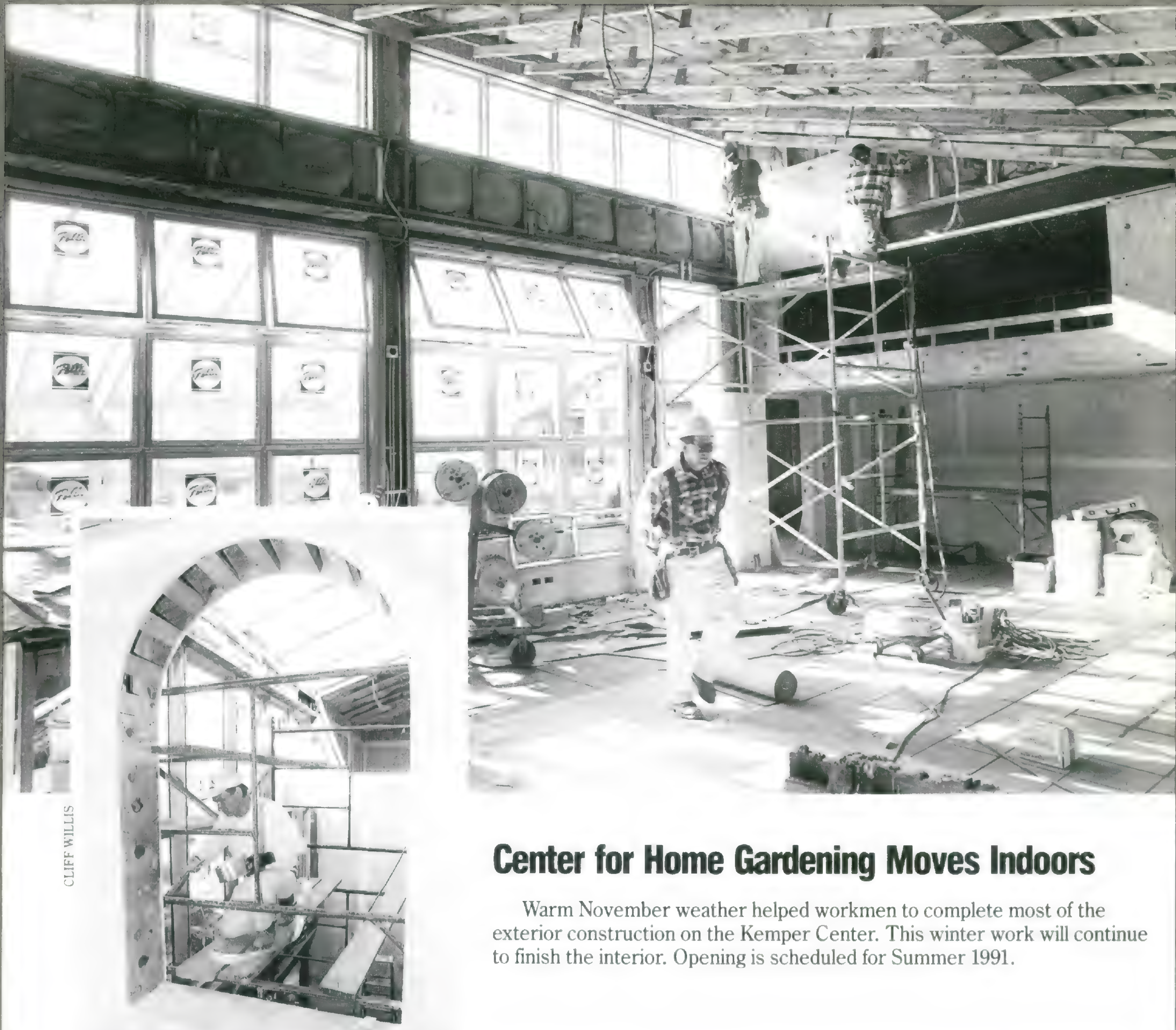

CLIFF WILLIS

Center for Home Gardening Moves Indoors

Warm November weather helped workmen to complete most of the exterior construction on the Kemper Center. This winter work will continue to finish the interior. Opening is scheduled for Summer 1991.

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On the cover: *Azaleas are in glorious bloom in April. Join us for the Members' Day Azalea Walk, April 25.*
—Photo by Pat Watson

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Comment

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An Exciting Spring Season

In approximately three weeks, spring 1991 will officially begin and everyone is, no doubt, anxiously awaiting its arrival. March typically brings with it a dramatic increase in gardening activities and this year the Garden will be offering a variety of programs to satisfy this interest.

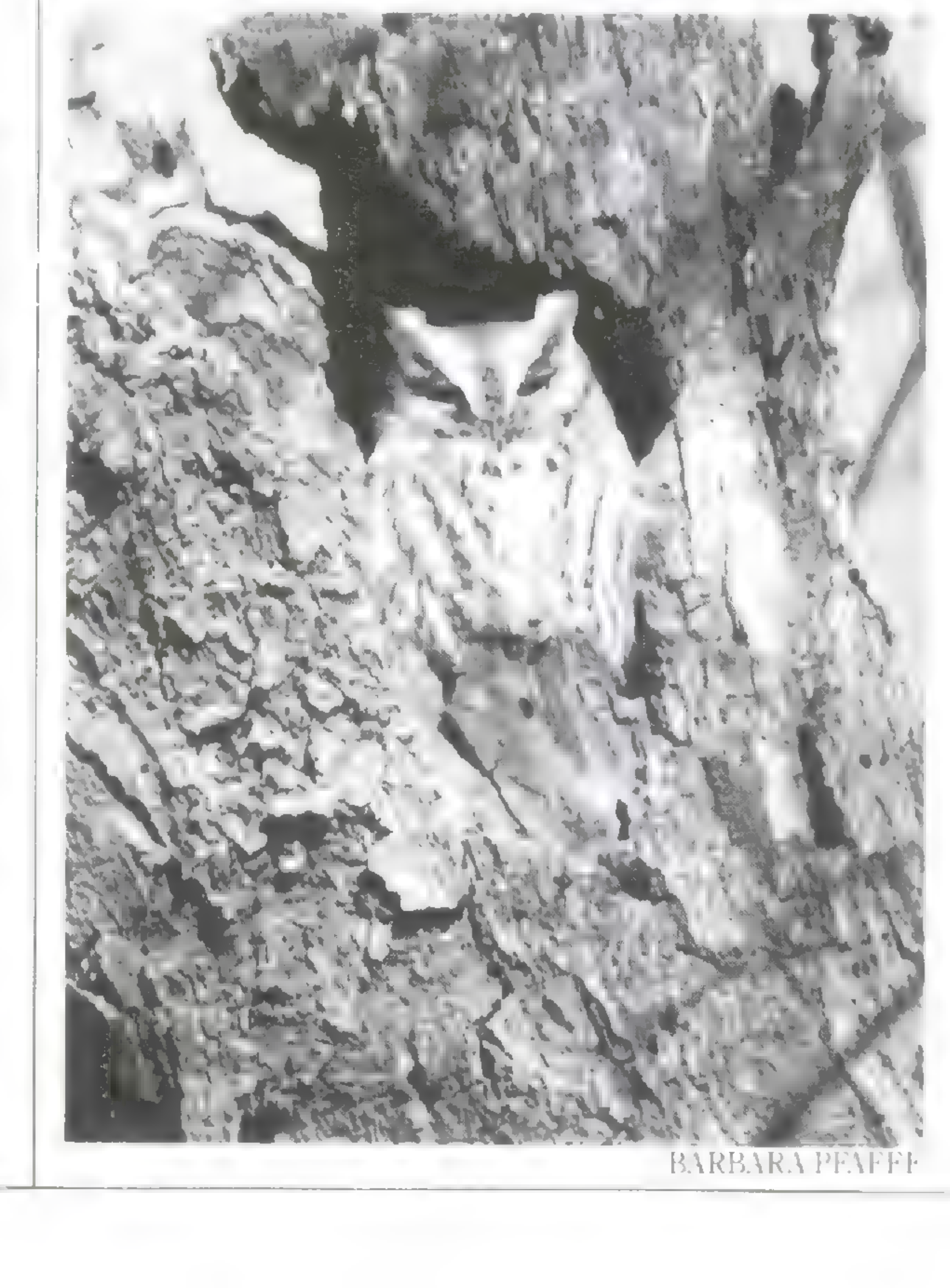
The Garden by Design lecture series, the Spring Gardening Fair cosponsored by the *St. Louis Post-Dispatch*, increased education activities, and the Spring Flower Show that opens to the public on March 9, guarantee wonderful ways to celebrate spring.

This year, as in past years, the Garden will continue to concentrate its efforts in providing environmental education through greater public awareness. The completion of our capital fund drive, which made possible the Climatron renovation, the construction of the Brookings Interpretive Center, the Shoenberg Temperate House, and the Kemper Center for Home Gardening pavilion, opened up new avenues to present information on the environment and ways in which we can use the earth's natural resources wisely. The Center for Home Gardening pavilion, with its opening scheduled in early June, is a dynamic opportunity to gain insight about gardening that should make it more productive, successful, and environmentally sound.

As was reported in the January/February issue, the Center for Plant Conservation has officially become a part of the Garden this year. The task ahead for the Garden and the Center is to create a coordinated effort at saving rare and endangered native American plant species. We are seeking a partnership with individuals and organizations who are committed to this mission. Garden members will be informed each step of the way as the Center is integrated into the Garden and I hope that you, as our strongest supporters, will assist us in efforts to expand the programs so that plant extinctions, and the resulting loss of biodiversity, can be stopped.

Please join us for the Spring Flower Show and all the activities planned over the next few months, and watch for your special invitation to the 1991 "Bed and Breakfast" happening again this spring—this time to help support the efforts of the Garden and the Center for Plant Conservation. My best to you this spring.

Peter H. Raven



BARBARA PFAFFE

Seeing Things?

This winter an Eastern Screech Owl took up residence in the historic yellowwood tree that grows along the eastern wall of the Garden, just south of the Spink Pavilion. Screech owls have either reddish-brown (red phase) or gray plumage, and this red phase owl could be glimpsed roosting during the day in a cavity of the tree. These owls are common in suburban areas with mature trees where they can roost, but they are often overlooked. They are nocturnal, or active mostly at night, and their plumage is well camouflaged.

—Barbara Addelson,
ECO-ACT Coordinator

BOARD OF TRUSTEES HOLDS ANNUAL MEETING

New Officers Elected

THE GARDEN'S BOARD of Trustees held its annual meeting on Thursday, January 24 and elected O. Sage Wightman III as its new presi- ent, John K. Wallace, Jr. as first vice-president, and illiam H. T. Bush as second vice-president. Special cognition was paid to outgoing president Robert E. resko.

Mr. Kresko joined the Garden's Board in 1981 and sumed the presidency in January, 1989. For the past ur years, he has chaired the Garden's highly suc- essful capital drive, the Campaign for the Garden, hich concluded at the end of 1990 and exceeded its itial goal by $4.4 million. During his last meeting as ead of the Board, Kresko emphasized the generosity the Trustees throughout the campaign: ''The rustees are the Garden's strongest and most dedi- ated supporters. Their combined energies helped ise our sights and their own personal commitments ccount for 39 percent of all funds raised. It is this credible dedication of the Trustees and the Gar- en's continually growing membership that has made y term as president so rewarding.''

He expressed appreciation to each Trustee and ave special tribute to Mrs. Harriet Spoehrer, the rgest single donor to the campaign. The William T. emper Foundation, the Shoenberg Foundation, and e Civic Progress group of corporate community aders provided significant outstanding support and ere recognized.

In 1986, when Kresko assumed the chairmanship the $16 million capital drive, he said that the Garden ad well over $25 million in capital and renovation eeds. ''Those other needs still exist and it is my ope that we can go beyond our goal so that we can eet some of these other demands.'' With his expert

continued on next page

RICHARD BENKOF

New president of the Board, O. Sage Wightman III (left), with retiring president Robert E. Kresko.

Mrs. Harriet Spoehrer was honored as the largest single donor to the capital campaign.

The capital campaign steering committee (standing left to right): William Orthwein, Robert Hermann, Clarence Barksdale, Lucius Morse, John Wallace, Warren Shapleigh, O. Sage Wightman. (Seated, left to right): C. C. Johnson Spink, Margaret Oberheide, Nora Stern, Robert Kresko.

guidance and support, the Garden exceeded its goal.

O. Sage Wightman III, the incoming president, recognized Kresko by commenting on the significant achievements of the past two years. "Not to mention the completion of the capital campaign, the Garden saw steady increases in attendance and support, with membership growth of almost 5,000 households," said Mr. Wightman. He also cited the Garden's first-time participation in a debt-for-nature swap with the government of Ecuador, which has led to the expansion of botanical research in that country; the outstanding article in the August issue of *National Geographic*; the agreement with the Soviet Academy of Sciences to establish a Flora of the U.S.S.R.; and the development and approval of the Master Plan for the future management of the Shaw Arboretum as other significant accomplishments during Kresko's term.

Mr. Wightman, the new president, joined the Board of Trustees in 1983. He became increasingly committed to the institution as he witnessed the exemplary leadership of Dr. Raven in furthering a greater comprehension of the environmental concerns facing the world. "It is our hope that the Garden will continue to grow as a significant contributor to the world's scientific community," added Wightman. "Dr. Raven and his staff conduct vital research that is having a direct, positive impact on how we can manage the environment of our planet. As president of the Board, I want to participate in ways that help the Garden continue to advance as a world-class research institution."

Wightman provided leadership during the capital drive in his capacity as co-chairman of the Membership Gifts Committee. He has also served as chairman of the Annual Giving drive for several years. Mr. Wightman said, "The annual giving effort was an excellent way in which each individual could help the Garden. The most gratifying part of efforts such as annual giving and the capital drive was working with the volunteers who gave of their time so willingly and enthusiastically."

Wightman, Senior Vice-President of Stifel Asset Management Company, becomes the 17th president of the Garden's Board of Trustees.

Peter H. Raven thanked Kresko for his dedication to the Missouri Botanical Garden and the St. Louis community. Raven said, "Robert Kresko's hard work and professionalism inspired all those associated with the Garden. His leadership and energy moved the Garden into the 1990s with confidence and direction."

Also at the January meeting, the Trustees elected Richard J. Mahoney, chief executive officer of the Monsanto Corporation to the Garden's Board, and re-elected Charles F. Knight, chairman and chief executive officer of Emerson Electric Company, and James S. McDonnell III, vice-president of the McDonnell Douglas Corporation.

Corporate Philanthropy Profile

EDITOR'S NOTE—Over the years the extraordinary commitment of area corporations has enriched the lives of all St. Louisans with contributions of funds, services and goods to nonprofit institutions. Corporate citizenship has helped the Garden to improve its services to the entire community in many ways. Most recently, corporate financial support was indispensable to the success of the $18 million Campaign for the Garden, accounting for one-third of the $20.4 million raised in the drive.

The top five corporate contributors to the Campaign for the Garden were the Anheuser-Busch Companies, the Emerson Electric Company, the McDonnell Douglas Corporation, the Monsanto Company, and the Southwestern Bell Corporation. During 1991 this series of profiles will highlight the charitable activities of each of these companies.

The Anheuser-Busch Charitable Trust

"When you think about charitable giving, Anheuser-Busch, through its Foundation and Charitable Trust as well as through corporate funds, is one of this nation's foremost philanthropic companies," reflected Robert E. Kresko, recent president of the Garden's Board of Trustees and chairman of the Campaign for the Garden. "Almost daily, we see examples of Anheuser-Busch's generosity to the community and worthy groups in need."

In 1989, Anheuser-Busch, through its Foundation and Charitable Trust as well as through corporate funds, contributed in excess of $25 million to nonprofit organizations located throughout the country.

As the company's headquarters location, St. Louis and its many nonprofit institutions benefit substantially from the company's civic-mindedness. Indeed, without the assistance of the Anheuser-Busch Charitable Trust, the face of the Garden might look vastly different. Over the past decade alone, the Anheuser-Busch Charitable Trust contributed toward the construction of the Ridgway Center and more recently made its largest gift to the Garden, $750,000 toward the various building projects in the just completed Campaign for the Garden, including the renovation of the Climatron.

In addition to its support for the arts and for civic and public affairs, the funding priorities of Anheuser-Busch, the Anheuser-Busch Charitable Trust and the Anheuser-Busch Foundation address this country's most pressing needs: higher education, social services, health care, environmental protection and medical research, including research into alcohol abuse prevention among youth. Emergency relief is also a central concern, such as the Anheuser-Busch Foundation's immediate pledge of $2 million to aid recovery from the 1989 San Francisco earthquake.

"We are happy to support institutions like the Garden, which add greatly to the quality of life for our community," said JoBeth Brown, chairman of the Contributions Committee for Anheuser-Busch.

"Corporate citizenship is crucial to the continuing health of the not-for-profit sector in America," observed Dr. Peter H. Raven, the director of the Garden. "The Garden provides services to this community that would be difficult, if not impossible, to replace, and we absolutely could not accomplish this without the backing of donors like the Anheuser-Busch Charitable Trust."

Above and at left: Robert Hapka-Tracy, (left) and Stuart E. Falk, independent living specialists representing Paraquad, enter the Ridgway Center. Paraquad, a not-for-profit organization serving people with disabilities in the St. Louis area, has recognized the Garden for its efforts to provide access for disabled visitors.

New Doors Open Garden to All Visitors

In late December visitors to the Garden were greeted by new automated sliding doors at both entrances to the Ridgway Center. The electronically-activated doors provide easy access to the grounds for disabled visitors. The installation of the doors was made possible by a generous gift from Janet M. Johnston.

The ramp leading from the upper entrance of the Ridgway Center to the Garden grounds was constructed in 1982.

The Garden has long had a commitment to make its display areas and facilities easily accessible to people with disabilities. Last year the Climatron complex was designed and renovated to be fully accessible, and the new Kemper Center for Home Gardening employs a full-access design utilizing ramps, level thresholds, automatic doors and elevators. With the installation of the Ridgway Center doors, visitors now can tour more than a mile of unobstructed pathways and display greenhouses. Special features include the Scented Garden, installed in 1983 with raised beds and plants available to touch and smell, and the Sciuto drinking fountain at the far end of the Japanese Garden, installed in 1988.

''It is important to make this beautiful resource available to all of our citizens,'' said Dr. Raven. ''We are dedicated to providing access to disabled persons so they may enjoy the wonders and beauty of the Garden. We are deeply grateful to Mrs. Johnston for helping to make this possible.''

Making Science Come Alive

The Garden's Magnet School Program Builds for the Future

YOU have to teach them the words—then make the words come alive!''

When Alicia Ivory House teaches science to children, her face lights up. That enthusiasm is contagious for the students she works with as the Garden's magnet school instructor.

Since the mid-1970s the Garden has worked in cooperation with St. Louis Public Magnet Schools at the Stix and Mason Investigative Learning Centers (ILC). These schools offer students a strong academic program that emphasizes inquiry, investigation and analysis through courses in natural sciences, mathematics and computer science. These basic approaches are used in the complete curriculum to develop students' skills at problem solving and productive thinking skills. The curriculum features enrichment programs offered by the Garden, the Zoo and the Science Center.

Science education has always been a major part of the Garden's mission. ''We hear a lot today about the problems with science education in this country,'' says Larry De Buhr, director of education at the Garden. ''We're working hard to do something about it. The magnet program at Stix and Mason is just one of our programs, serving about 300 students annually, and we're seeking to expand it.''

RICHARD BENKOF

A third grade class from Stix ILC with teacher Alicia Ivory House in the Climatron.

Alicia works closely with the teachers at Stix and Mason to structure the Garden's classes to fit the schools' curriculum. Programs offer enrichment in botany, horticulture, ecology and environmental science. ''Visiting the Garden, actually seeing and touching plants, is a vital part of learning for the children,'' says Alicia. ''Science can be just a lot of dry, abstract concepts unless you can visualize it. We emphasize the scientific method as a way to help students approach any subject, to organize their thinking. When they can define the problem, gather information, verify facts, and reach conclusions, they can learn anything!''

Regular weekly classes at the Garden are another advantage for the magnet program. ''Each class builds on the one before,'' Alicia explains. ''The sequential, hands-on approach creates a sense of excitement for the students. We work with children from Stix ILC in grades 3, 4, and 5, and with students from Mason ILC in grades 6 and 8. Many of these children come back year after year, building on what they have learned.''

Classes for 3rd, 4th, and 5th grades are eleven-week programs covering topics from seeds and germination to photosynthesis to plant propagation. In each session students collect or make something to take home; for instance, they may plant a terrarium or make a map. Older students keep lab journals, study uses of plants, and visit the Garden's herbarium and research facilities. The 6th grade program for next year will focus specifically on the tropical rain forest.

St. Louis magnet schools bring together students from all parts of the city and county. Cooperative learning is a major component of the program. ''I have the students work in teams,'' Alicia explains. ''They may not be paired with their best friends, but they learn to work together with respect, to help each other and learn from one another.

''A good teacher is a performer,'' Alicia goes on. ''It's up to me to make science exciting, to share my knowledge in a way that will encourage students to learn more. One of the things we do is to talk about different careers in science. It motivates children to realize that there are lots of ways to make use of their nterests; you don't have to be a Nobel Prize winner to love science."

"The love of science and learning is what we are trying to give to students," adds Larry DeBuhr. "The future of our society depends on strengthening the quality of our science education, and encouraging students from all backgrounds to pursue it throughout their ives. Alicia's work goes a long way toward making that happen."

Catholic Schools Benefit from New Program

In the 1990-91 school year local cultural institutions launched a unique collaborative education program in conjunction with St. Louis City Catholic Schools, with funding from Adelaide and Dan Schlafly. Mr. Schlafly is a Garden Trustee.

The Missouri Botanical Garden, the St. Louis Zoo, the Missouri Historical Society, the St. Louis Science Center, and the Cahokia Mounds Museum are working together to provide a series of multicultural experiences for St. Louis Catholic school children in the 4th, 5th, and 7th grades. Each 4th grader from a predominantly black school is assigned a partner from a school with a predomnantly white population. The students have the opportunity to experience a series of six enriching programs with that same partner at the Garden, the Zoo, and he History Museum. The Garden provides a follow up tour for the 5th grade. Seventh grade students participate in a similar field trip series at the St. Louis Science Center and the Cahokia Mounds Museum.

The theme for the joint programs is "Living in a Changing World." The goal s to bring together students from diverse backgrounds to explore cooperaively a changing world through scientifically and historically enriching experiences. Program topics include food chains; nature awareness; animal adaptaions, characteristics, and relationships; astronomy; the physics of motion; St. Louis history; and Native American history.

"This program presents an excellent opportunity to break down racial barriers and provide positive multicultural experiences for our students," said Sister Mary Ann Eckhoff, superintendent of education for the Archdiocese of St. Louis.

THIS SPRING AT SHAW ARBORETUM

How Sweet It Is!

It's a cold, sunny day with snow on the ground; the clanking of buckets can be heard through the woods. In the distance by the old barn, steam is rising from the large evaporator pan. Images of New England come to mind, but the steam is enveloping the education staff of Shaw Arboretum as they work with elementary school students to boil down collected sap of the sugar maple, *Acer saccharum*, until it becomes golden brown syrup.

When the leaves appear, every tree becomes a sugar factory. Through the chemical process of photosynthesis, chlorophyll in the leaves captures the energy from the sun enabling carbon dioxide from the air and water brought up from the roots to make sugar. This sugar is used by the tree as a source of energy to make new leaves and wood. The tree produces surplus sugar which is converted to starch and stored in the tree during the winter. As the days grow longer in late winter the stored starches are changed back to sugar and are circulated throughout the tree as sap. It is this sap that is drawn off when the tree is tapped.

The collecting season is usually two to four weeks long and the old saying, "warm, sunny days and cold nights" is very accurate in determining when the sap will flow. Maple syrup programs at the Arboretum run from mid-February through the first week of March.

Equipment is sterilized and the trees are selected. Holes are drilled into the tree 2 inches deep and at a slight upward angle and metal spouts, called spiles, are inserted into the holes. Buckets are then hung from hooks on the spiles and the sap is collected each day to prevent fermentation. It's not unusual to find the three gallon buckets filled to the top.

Students arrive each day bundled from head to toe and full of enthusiasm. Through a series of activities led by the education staff, the students gain a better understanding of photosynthesis and the water cycle, the two natural processes that make maple syrup possible. As the group approaches the tapped trees, an excited student cries, "There's a bucket!" — and off they go.

After a brief demonstration on how to collect the sap, the students are off with their partners, going from bucket to bucket. One often hears shouts of "Wow, this bucket's overflowing!" or "Look, it's dripping right from the spout, just like the kitchen sink!"

The sap is collected and poured into a large pan called an evaporator, which sits over a roaring fire. The sap is about two to four percent sugar. Only after most of the water in the sap has evaporated and the temperature reaches 219°F do we have finished maple syrup—a saturated sugar solution that is about 67 percent sugar.

Once the students have made a batch of maple syrup it's easy to understand why it is so expensive to buy in the store. Producing syrup takes a lot of physical effort, as well as approximately 40 gallons of sap and 1.3 cords of firewood to make one gallon of pure maple syrup. A more fitting name for the syrup might be "liquid gold." But, oh, how sweet it is!

Students strain maple sap into a collection container.

—Lydia Toth
Education Coordinator,
Shaw Arboretum

Keeping Track of 24,000 Plants

EDITOR'S NOTE—It is astonishing to realize that just eight years ago the Garden's Plant Records Office maintained its information on a file of 20,000 index cards. The office is part of the horticulture division and is responsible for keeping records on every living plant growing on Garden grounds or in the display and production greenhouses.

In 1983 two volunteers, Kay Sofian and Paul McClinton, began the enormous task of transcribing the data to computers. The job took three years, and today Kay and Paul continue to work on the plant records together with longtime volunteers Joyce Broughton and Adrienne Biesterfeldt.

The use of computers has been of critical importance to horticulture at the Garden, permitting detailed study and accurate management of the entire living plant collection. With increasingly sophisticated applications, the Garden's computers can generate lists of plants and their precise locations on the grounds.

Have you ever wondered how many different types of plants are cultivated at the Garden? This would be difficult to determine if the Garden did not have up-to-date computer records on the plants in the living collection. A search of the records indicates that the Garden's living collection consists of about 11,000 different plant taxa belonging to 262 plant families. The collection includes 2,900 orchid, 950 daylily, 650 iris, and 210 rose varieties. The Climatron alone contains over 1,300 kinds of plants representing 156 families.

More than 14,000 plants are on display to the public, and the rest are in research or production facilities. In addition to the plants listed in the living collection computer data base, the research greenhouses contain over 1,400 species plus about 400 plant types that have not yet been definitively identified to the species level of classification.

Having all of this information on computers is enormously helpful to horticulturists and researchers. Lists can be generated of all the plants at the Garden from a certain plant family or genus, all plants native to a particular geographic region, or even all the plants collected by an individual, to name just a few examples.

New Mapping System With over 14,000 plants on display on the grounds or in the public conservatories, how does the Garden keep track of where these plants are located? The answer is the Garden's grid system, which has recently undergone refinement to make it extremely precise. This precision, along with a new computer mapping system, enables the Garden not only to locate its plants, but to plot their locations on custom maps.

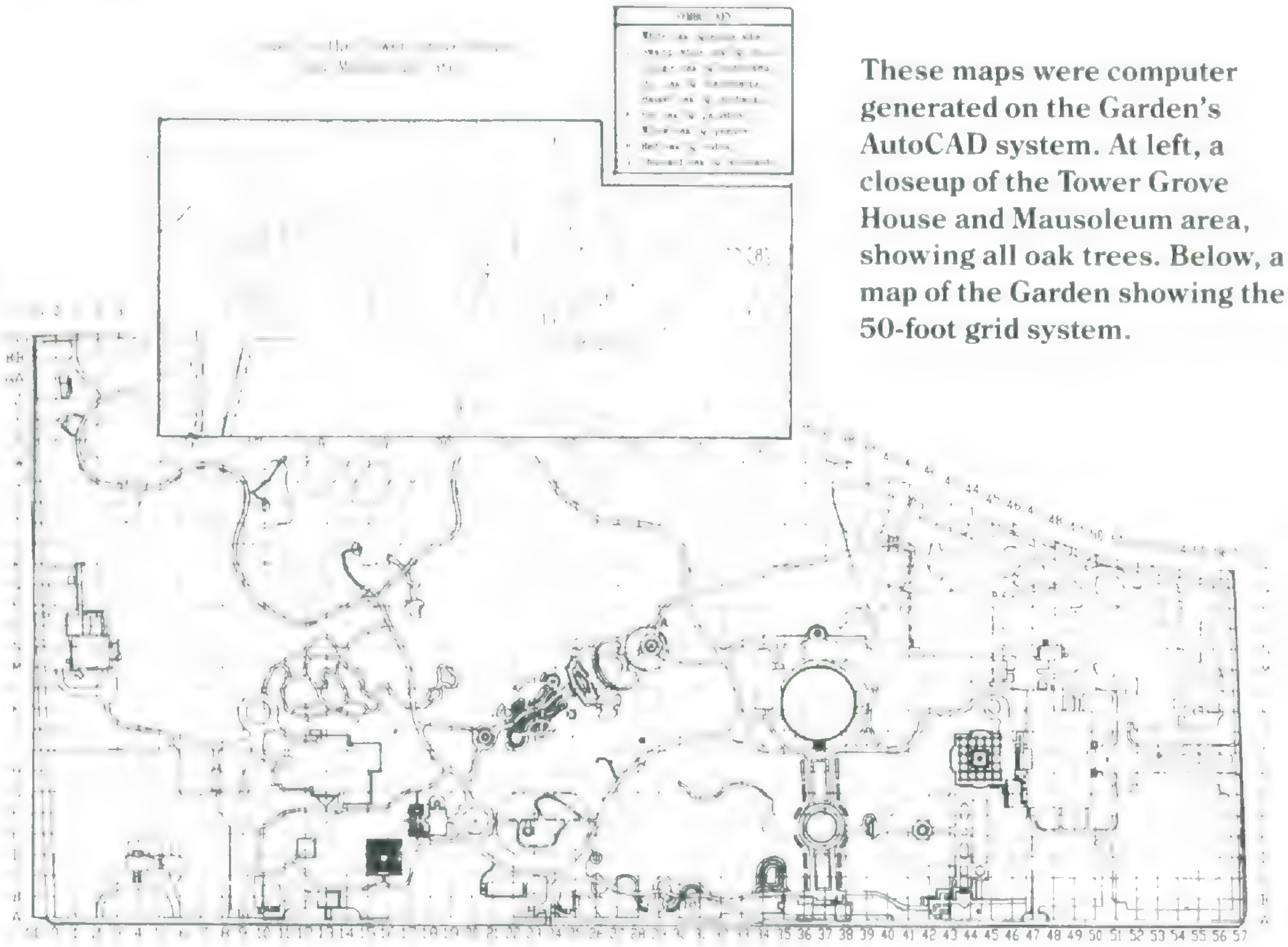
The backbone of the system is an imaginary grid pattern, in use here for many years, that divides the Garden's 79 acres into 50-foot squares. The squares are defined by numeric north/south coordinates and alphabetic east/west coordinates. Each plant's coordinates are part of its computer record and describe each plant's location on the grounds to within 50 feet.

Although these 50-foot grids would make it easy to find larger specimens or those in sparsely planted areas, locating a small plant in a densely planted area such as the English Woodland Garden could still be a problem for anyone not familiar with the plant and the area. In 1989 this problem was solved by horticulturist Don Mee, who surveyed the grounds as part of an Institute of Museum Services grant. Mee initiated the technique of dividing each 50-foot square into tenths to identify each plant's location to within five feet. For example, a plant that was previously described as having coordinates 13-M might now be identified as 13.3-M.7. All of the large woody trees and shrubs have been assigned decimal coordinates, and the task is nearly complete for all of the perennials.

The locations of plants in the Climatron are also described by a similar coordinate system, but it is based on a ten-foot grid pattern without decimal indications.

Mee further improved the Garden's plant locating ability by installing and making customized programs for the AutoCAD mapping system. AutoCAD, a computer package used extensively by engineers and architects, has been in use at the Garden for the past year. It allows the Plant Records Office to plot the location and, in some cases, the relative sizes of plants on a map of any portion of the Garden. The maps can be printed in up to six colors, and can include bodies of water, buildings and walks, and utilities. The AutoCAD maps are enormously useful for planning new garden areas and for helping visitors to find specific specimens on the grounds.

—*Greg Wieland,*
Garden horticulturist



These maps were computer generated on the Garden's AutoCAD system. At left, a closeup of the Tower Grove House and Mausoleum area, showing all oak trees. Below, a map of the Garden showing the 50-foot grid system.

Conservation Center volunteers (left to right): Ginny Turner, Jane Thomas, Armyn Spies, conservator Vicki Lee, Patrick Kegin, Paula Brooks, Robert Buck.

BOOK CONSERVATION AT THE GARDEN

Where Work is a Pleasure

EDITOR'S NOTE — The bindery in the Garden library was established in the mid-1960s, creating one of the few libraries in the United States with a separate facility devoted to preserving books. Generous support by the Shoenberg family made possible significant expansion and improvements in the Center, which was named the Shoenberg Conservation Center in their honor in 1986.

The Garden's library is one of the world's finest collections of botanical literature, and many of its acquisitions are old, fragile, rare or difficult to replace. The Shoenberg Conservation Center is dedicated to the physical preservation of the collection, and to ensuring that all of the books and materials are functional and serviceable for years to come.

All work at the Center is performed by hand or with hand operated machines. The techniques used are similar to those used in the 17th century for bookbinding, and require meticulous craftsmanship. The results are a tribute to the work of Garden conservator Vicki Lee and her staff of dedicated, enthusiastic volunteers.

Some people are fortunate enough to combine their work with pleasure. Such is the case with Vicki Lee, Conservator for the Garden library. Book conservators must be skilled in the craftsmanship of their profession and often use their talents in hobbies or handicrafts. Conservation work requires creativity in choosing materials and binding styles, as well. Vicki says, "Work for me is a pleasure. All conservators share a love of reading, as well as an appreciation of the book as a valuable object in itself."

Exacting craftsmanship is required to repair, restore, and preserve the Garden's valuable collection.

When pressed, Vicki will concede that while her job is pleasurable, it is not play. As conservator it is her responsibility to plan, coordinate, and carry out activities that result in books that are functional and serviceable to the library's patrons. These activities include book repair, bookbinding, and restoration; advising about environmental conditions; planning for damage prevention and recovery in case of an emergency; keeping statistics; writing reports; assisting with the preparation of grant proposals; and carrying out special projects.

Vicki enjoys training and working with the conservation center's volunteers, and certainly her volunteers enjoy working with Vicki. Jane Thomas, who gives two days each week to conserving the Garden's collections, says "Completing the projects is challenging and satisfying. It's like going to arts and crafts every day. And it's fun to work with all the wonderful equipment and tools in the Conservation Center." Patrick Kegin, who also gives two days per week to the Center, says that his attraction to working in the library is his basic love for books. He adds that it is wonderful to work for Vicki, who is so competent at teaching crafts that will endure long after we are gone.

Vicki began her career as an art history and English literature major and discovered her talent for book conservation while she was a library assistant at the Art Institute of Chicago. She received her advanced bookbinding diploma in 1989 from the North Bennet Street School, a highly respected crafts institute in Boston. Vicki joined the Garden library staff in late 1989 and immediately set to work organizing conservation center activities, producing fine work, training volunteers, and providing a place where coming to the office can be a real pleasure.

—Constance P. Wolf,
Garden Librarian

Home Gardening

Soil Testing: Why, When & How

It is an article of faith for many home gardeners that a springtime application of 10-10-10 all purpose fertilizer will solve all of our soil preparation needs. It would be nice if it were that simple! Unfortunately, indiscriminate use of fertilizers may pollute groundwater and cause buildup that can actually damage your plants.

Good growing conditions require a balanced interaction among soil type, nutrients, pH level, organic matter and water. A soil test is the best way to understand what your soil really needs for the plants you want to grow.

WHAT'S IN A SOIL TEST?

Typically, a soil test will give you recommendations for amounts of nutrients to be applied. The interpretation of the recommendations can be confusing. Laboratories commonly deal with farm crops and report test values in pounds per acre or parts per million. Neither of these has much meaning to the common homeowner or backyard gardener. Also, the reports include a lot of numbers and seem complex; rarely will you see one that explains whether the level of a nutrient is in an acceptable range or not. I found this out recently when I sent portions of a single soil sample to six different public and private laboratories to compare their results. The labs all came up with approximately the same numbers, but their recommendations differed, and some labs did not do all of the tests requested.

Despite the frustration it is important to take the time to understand the recommendations. For example, if a phosphate application is not suggested, do not apply it, even if you have a fertilizer that includes phosphate with recommended nutrients. It may seem like a lot of trouble to buy ingredients separately and mix them to get the right blend for the job, but it is better to do this than to waste fertilizer and risk buildup than can burn plant roots.

A good soil test will include several factors that will help you to evaluate what needs to be done. These factors are: pH level, which measures acidity or alkalinity; the percentage of organic matter; levels of available phosphorus, potassium, magnesium and calcium. Nitrogen levels are not usually included in a soil test, because nitrogen must be replaced annually.

pH LEVEL

The pH level indicates the acidity or alkalinity in the soil. A measurement of 7.0 is neutral, and optimum pH for most growing sites is between 6.0 and 6.8. When the soil is too alkaline, or greater than 7.5, elements such as iron, zinc, copper and manganese are locked up in the soil and are no longer available to plant roots. A similar situation exists when soils are too acidic, or below 5.0, although certain plants like rhododendrons, blueberries and potatoes do much better in acidic soil of 5.2 to 5.8.

Generally speaking, most soils in the local area register a pH in an acceptable range for growing plants. Adding lime to make the soil "sweeter" or more alkaline should not be a standard practice and is very rarely called for. If the pH is around 5.8, some liming can be done to raise it. However, it should be done in stages of application to avoid burning the plant's roots.

ORGANIC MATTER

Most gardeners who are serious about growing plants recognize the value of adding organic matter to planting beds to improve drainage, soil compaction, aeration and moisture levels during drought conditions, especially in heavy clay soils. Vegetable gardeners commonly work in organic materials every year and levels here often exceed ten percent. Organic matter is an excellent source of nitrogen, supplying ¼ to ¾ pound for every one percent of organic matter in the soil. If you are planting perennials or turfgrass, take the time to prepare the beds by thoroughly incorporating organic material before you plant. Later on, surface mulching is the only way to affect the organic matter content of the soil once it is planted.

PHOSPHOROUS

Phosphorous is important to energy systems and primary root growth. When it is applied as fertilizer it stays in the soil for long periods, so it is often not necessary to use fertilizers containing phosphate every year. The soil may already have sufficient levels if some fertilization has been done in the last three to five years. Extreme pH levels (below 5.0 and above 7.5) and cold soil temperature will inhibit plants' ability to absorb phosphate, so early plantings of vegetables and newly seeded turfgrass should be accompanied by a starter fertilizer containing phosphate. A phosphate test should register in the area of 6 pounds per 1000 square feet, a desirable range for most crops.

POTASSIUM

Potassium supports many functions in plants, including strengthening cell walls and regulating water. Potassium levels in the soil drop as vegetables are harvested and grass clippings are removed. If grass clippings are left on the lawn, as the Garden recommends, you will seldom need to fertilize with potassium.

Soil test levels around 10 pounds per 100 square feet are desirable. If your soil tests lower than this the level should be built up, but be careful not to burn plants. Each application should not exceed 1.5 pounds of potassium fertilizer, applied four to six weeks apart.

CATION EXCHANGE CAPACITY (CEC)

Magnesium and calcium are rarely ever deficient in soils, but their levels reflect the capacity of the soil to deliver nutrients. Each soil holds on to nutrients to some degree, and if the supply of nutrients is low, the chemical grip is tighter, making it hard for plant roots to absorb nutrients for growth. When magnesium and calcium are measured in the soil, a number is generated which is referred to as the cation exchange capacity (CEC). This tells you how well soil delivers nutrients to plants, depending on the amount and type of clay and organic matter present. The CEC provides some assessment of how much fertilizer you should use.

WHEN TO TEST YOUR SOIL

Most people do not think about fertilizers and soil testing until the spring. This is fine, except that you should be prepared to wait several weeks for the results, as laboratories are typically very busy with samples submitted by farmers. For turfgrass this is no problem, because fertilizer applications should not begin until May, with the heaviest amounts being applied in the fall. The only other drawback to spring testing is that if you plan to use a purely organic approach to fertilizing your vegetable garden, there is not much time between incorporation and planting for the material to decompose and supply nutrients to the soil. Decomposition depends upon warm soil temperatures above 60° F.

If you are planning to use organic techniques for supplying nutrients, plan to test your soil later in the season. Allow ample time for organic materials to break down over the winter and early spring to liberate nutrients.

RECOMMENDATIONS

The soil test report should tell you how much phosphorus and potassium to till into the soil. Once in the soil they are relatively immobile, so you do not have to worry about repeating the application in spring. For best results, potassium and particularly phosphorous should be scratched into the root zone of plants or crops. During the latter part of the season, when plants are beginning their dormancy, they are less likely to suffer root damage from incorporation.

The soil test will also indicate if the soil's organic matter content is low. Adding organic matter in the fall helps to aerate the soil and improves its texture, making it less susceptible to compaction from snow and ice. Organic material also improves water drainage so soil dries out more quickly in the spring, and it contributes nutrients to the soil as it decomposes. Most soil test reports do not give recommendations for how much organic matter to add. Generally speaking, a six-inch layer incorporated into the soil will raise the organic content by about one percent.

FERTILIZERS

There are two broad categories of fertilizers: inorganic and organic. Inorganic fertilizers are made from nonliving materials, such as rock or mineral deposits. Some are produced through chemical reactions. The nutrients in inorganic fertilizers are usually readily available shortly after application and are absorbed during active plant growth.

Most organic fertilizers are derived from animal and plant remains. However, some organic fertilizers are synthetically made from carbon-based chemicals. The term ''organic'' means that carbon forms the basic chemical structure of the fertilizer. If you are an organic grower, then classically you are interested in fertilizers of plant and animal origin only. These materials usually release nutrients slowly, reducing the potential for fertilizer burn.

The biggest difference between the two types of fertilizers is the way in which they affect the physical properties of the soil. Organic fertilizers not only supply nutrients, they also supply organic matter, which, as we have seen, benefits root growth by improving soil aeration, water and nutrient holding capacity and soil texture. Inorganic fertilizers do not improve the physical properties of the soil to any great extent. But you should understand that ultimately the nutrients supplied to the roots are the same regardless of whether they were derived from inorganic or organic sources.

WHO TESTS SOILS?

In Missouri, most soil testing is done by University Extension. There is an Extension office located in every one of the 114 counties in the state. In certain other states, like Illinois, most testing is done by independent laboratories. In either case, the fees generally are reasonable and range from about $5 to $20 depending upon what is requested. The basic test should include a measure of pH, phosphorous and potassium, but you should check on this before submitting your sample. You should also request recommendations. Some laboratories do not automatically supply this information and there may be a separate charge.

In June the Missouri Botanical Garden will begin to accept soil samples for testing. This is part of a new program through the Center for Home Gardening aimed at helping people understand more about growing and maintaining plants in and around the home. A packet of information on soil testing and soil sample bags will be available at the Center, and for a small fee, samples will be tested. The Center will provide recommendations for all plants, soils and growing conditions, based on test results.

—Steven D. Cline, Ph. D.

Timely Tips from the Answer Service

Do you have a plant question? Call the Horticultural Answer Service, Monday through Friday, 9 a.m. to noon, at ***577-5143.***

March Tips

- Now is a good time to repot any crowded houseplants. Pot in containers that are only one size larger. Prune any spindly shoots. Begin fertilizing as new growth appears.

- Not only is *Forsythia* welcome for its spring flowers, but it also serves as a fairly reliable indicator plant. Gardening lore holds that when this shrub blooms, it is time to apply crabgrass preventers to the lawn (mid-March to mid-April). Rose growers look to this bush as a reminder to begin spring pruning and to start gradually pulling back mulches (late March or early April).

- If weather permits, summer and fall blooming perennials may be divided now.

- Inspect the garden pond for water clarity. If brown, murky water and bottom sediments are present, drain and clean the pool before growth begins.

- Finish pruning apple and pear trees. Grape pruning should also be completed. Remove winter killed canes from brambles.

April Tips

- Cut back ornamental grasses. These can also be fertilized at this time.

- Fertilize perennials as growth begins. Use a complete formulation low in nitrogen.

- When planting trees, forget the old rules about adding large amounts of organic matter to the soil. In heavy clay soils this will only encourage the roots to stay inside the hole rather than infiltrating the surrounding soil. New guidelines suggest a hole wide enough to easily accommodate the root ball but only as deep as the ball's height. Backfill with the native soil and loosen the soil around the planting hole to a diameter five times the width of the root ball. Organic matter can be added to the loosened soil surface as a mulch and renewed annually. The tree roots will grow into the loosened soil area.

- Set out plants of broccoli, cauliflower and cabbage by mid-month.

- Prune back early spring flowering shrubs as soon as their blossoms have faded.

- Aerify, lightly fertilize and overseed patches in winter damaged bluegrass and fescue lawns.

- Prune peaches and other stone fruits just before they bloom.

- Avoid cultivating too deeply in the asparagus bed. Damage to the shoots will result in deformed spears.

- Plant hardy lilies and other hardy aquatics outdoors in the pond.

—Chip Tynan, The Answer Service

Missouri Botanical Garden
CALENDAR OF EVENTS
March-April 1991

MARCH 9-APRIL 7 / Spring Flower Show

9 a.m. to 5 p.m. daily, Orthwein Floral Hall. An enchanted "cottage-in-the-woods" is surrounded by beautiful spring flowering trees, bulbs, annuals and perennials. Take a fairy tale stroll through this wonderland and enjoy all the beauty and promise of springtime. *Members' Preview—see March 8.*

MARCH 20/MEMBERS'DAY "Sneak Preview" Tour

10 a.m. to 3 p.m., Kemper Center for Home Gardening. Continuous guided tours give an advance look at the Center, scheduled to open June 9. Free, for members only.

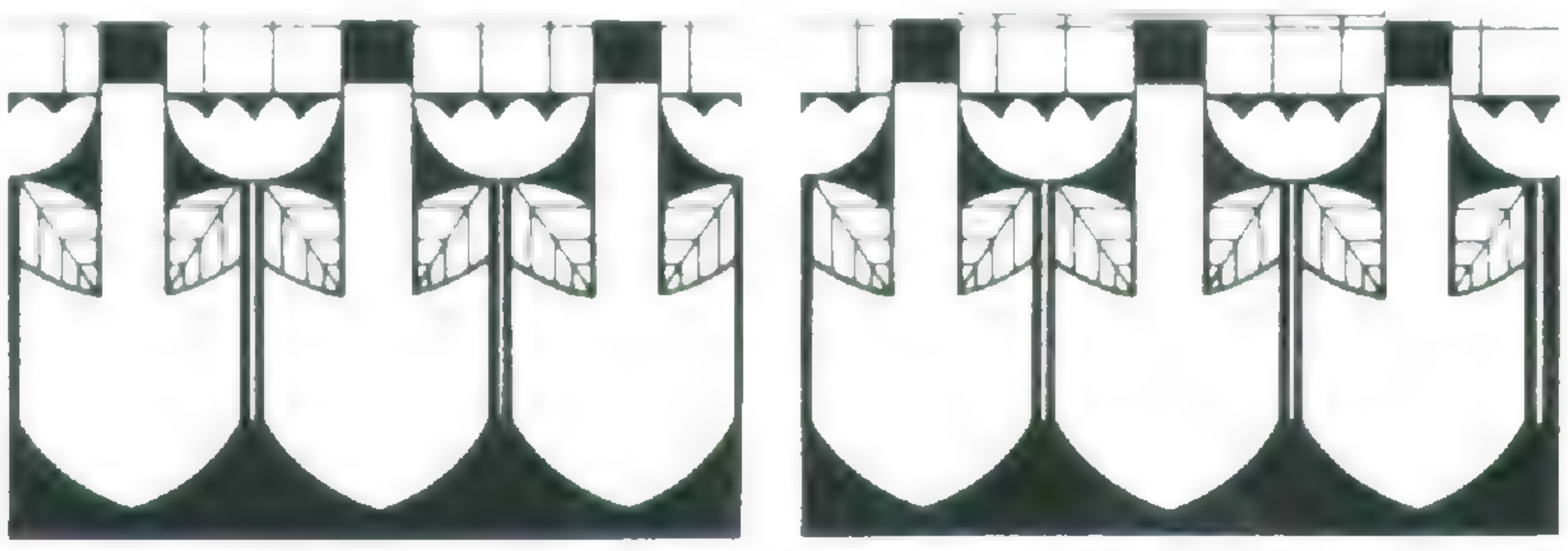
APRIL 25/MEMBERS' DAY Azalea Walk

10 a.m. to 3 p.m., continuous guided tours, grounds. Enjoy one of the early displays of springtime splendor, the azaleas. Receive a free flyer on the planting and care of azaleas. Free, for members only.

MARCH

MARCH 5, 12, 19, 26 Gardening by Design Lecture Series

Four Tuesdays, 1 and 7 p.m. This popular lecture series features well known horticulturists and landscape designers. Available by subscription for the afternoon and evening series, $15 members, $18 non-members. Afternoon and evening tickets cannot be mixed in a subscription. Single tickets are available at the door, only if the series has not sold out; $5 members, $6 non-members.



2-3 SATURDAY & SUNDAY

Spring Gardening Fair

10 a.m. to 5 p.m., Ridgway Center. Co-sponsored by the St. Louis Post-Dispatch, this event will feature a lecture series on gardening topics and displays by local nurserymen and floral societies. Advance registration is required for the lectures which will run from 10 a.m. to 3:45 p.m. on Saturday, March 2 and from 12:30 p.m. to 4:15 p.m., Sunday, March 3. Displays will be open 10 a.m. to 5 p.m. Call 577-5125 for additional information. Regular Garden admission. Advance reservations are required for lectures, $5 per person.

4 MONDAY

Plant Clinic

9 a.m. to noon, Ridgway Cent
Bring us your tired, sick plant
yearning to be green. The St.
Master Gardeners will examin
recommend ways of improving
health of your house, garden a
landscape plants. Samples of s
plants are welcome and encou
to help gardeners diagnose pla
problems. Free.

5 TUESDAY

Gardening by Design Lectu
"The Front Garden"

1 and 7 p.m., Shoenberg Audi
rium. Gardening writer Mary
Smith discusses ways to impr
the appearance of your home.
highlight for details.

8 FRIDAY

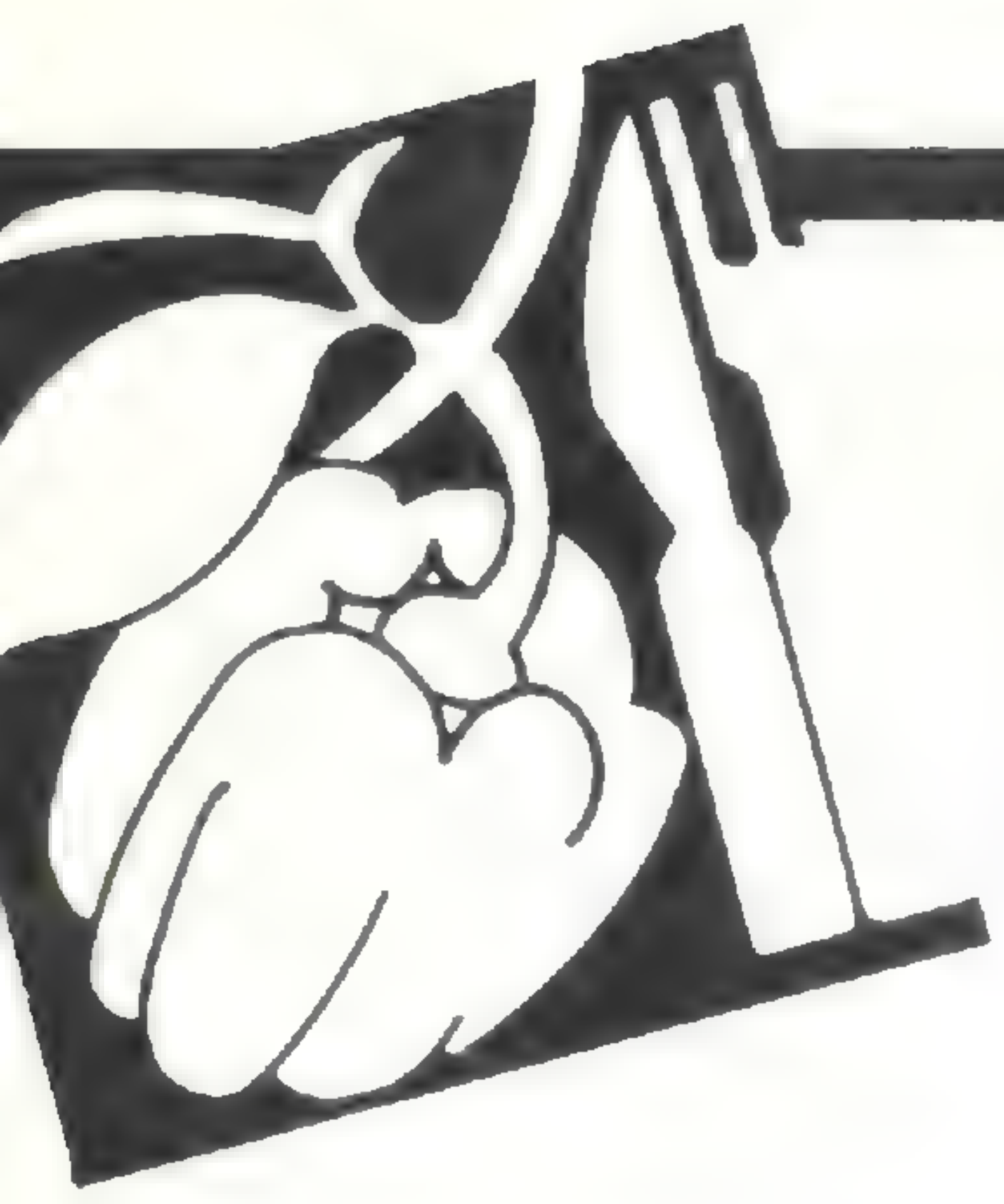
Members' Preview of
Spring Flower Show

5 to 8 p.m., Orthwein Floral H
Enjoy a first glimpse of spring
Also get a preview of an exhib
watercolors, oil paintings, and
ings featuring the Garden by
St. Louis artist Jerry Thomas
Entertainment, cash bar. Dinn
buffet will be available in Gard
view Restaurant. Free, for me
bers only.

9 SATURDAY

Jerry Thomas Exhibit Open

9 a.m. to 5 p.m. daily through
7, Ridgway Center. Sixty-five
watercolors, oils, and drawing
St. Louis artist Jerry Thomas
ture the Garden. Concurrent
exhibits at Norton's Fine Art S
dios and the Art Gallery at Ho
low will feature additional wor
Thomas and will comprise the
largest collection of artworks o
Garden ever produced. Free v
regular Garden admission.



TUESDAY

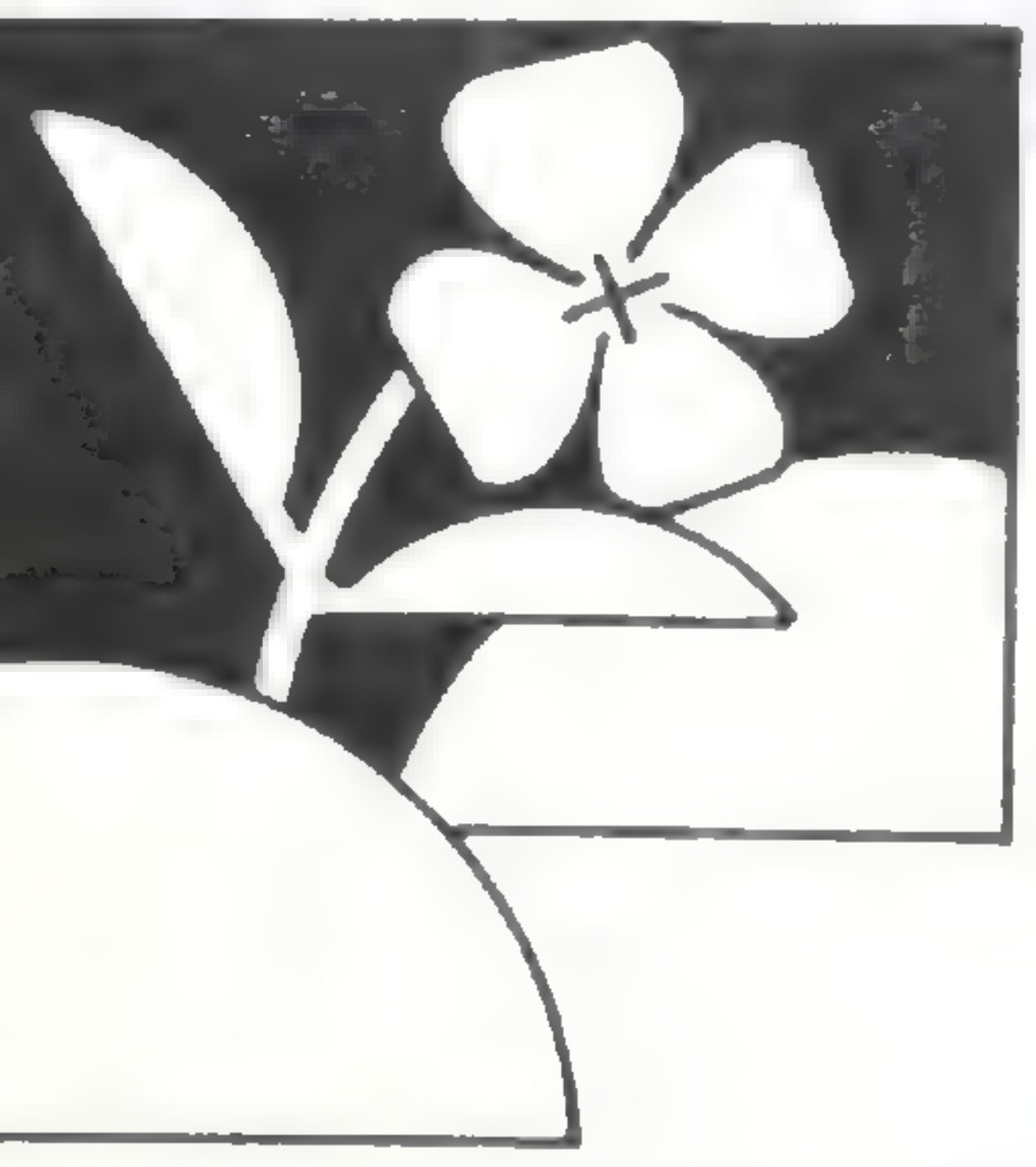
ning by Design Lecture:
Cook's Garden"
p.m., Shoenberg Audito-
uthor Shepard Ogden intro-
new crops and growing
ues, and some new ideas
he traditional vegetable gar-
e highlight for details.

SUNDAY

Lecture: "Outdoor
ssionist Style"
Shoenberg Auditorium.
uis artist Jerry Thomas dis-
how to paint landscapes out-
Works from his exhibit on
in Monsanto Hall will be fea-
Free with regular Garden
ion.

MONDAY

Clinic
to noon, Ridgway Center.
rch 4 for details.



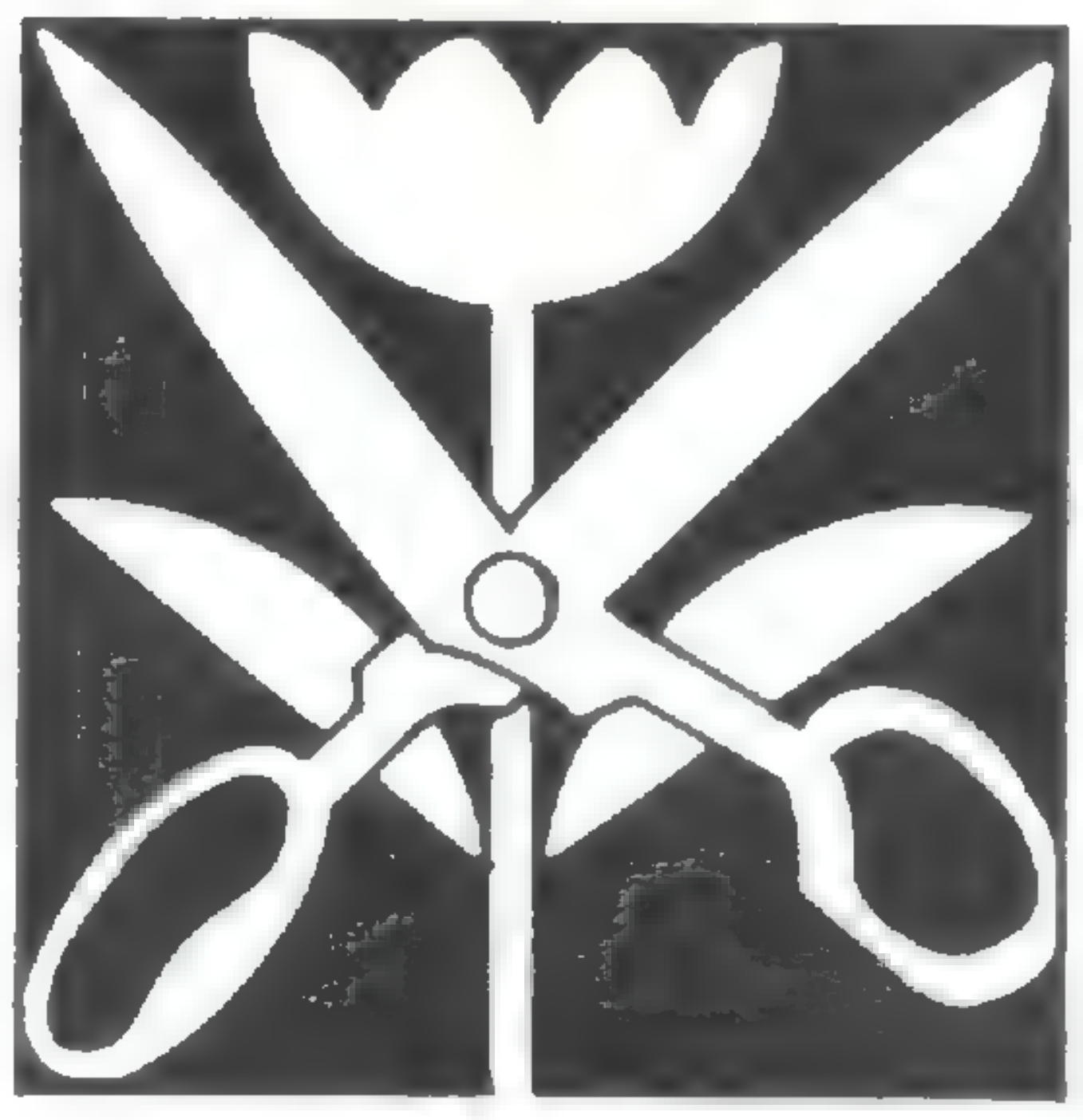
TUESDAY

ning by Design Lecture:
nnials and Wildflowers in
ck Garden"
p.m., Shoenberg Audito-
Panayoti Kelaidis, curator of
ck Alpine Garden at Denver
Gardens, demonstrates
create year-round interest in
ck garden.

21 THURSDAY

Preview Lecture: "Lewis and Clark Natural History Tour"

11 a.m. and 7:30 p.m., Shoenberg Auditorium. Join tour leaders Dr. Nancy Morin and Dr. Marshall Crosby of the Garden, and Dr. Ray Bruen of the Riverlands Association, for a preview of the tour coming up June 14-28. See page 14. Free, for members only.



26 TUESDAY

Gardening by Design Lecture: "The Cutting Garden"

1 and 7 p.m., Shoenberg Auditorium. Bill Snyder, superintendent of gardens and grounds at Stan Hywet Hall and Gardens, Inc. will offer tips on how to create a source for fresh and dried flower arrangements in your own backyard. *See highlight for details.*

APRIL

1 MONDAY

Plant Clinic

9 a.m. to noon, Ridgway Center. See March 4 for details.

4 THURSDAY

Estate Planning Seminar

9 a.m., Ridgway Center. See page 19. Free, reservations required: call Ernestina Short at 577-9532.

5 FRIDAY

Arbor Day Celebration

Times and locations to be announced. The Garden will host a series of tree plantings in St. Louis city and county parks, in honor of Arbor Day. All are invited to attend these special neighborhood tree plantings. Call 577-5125 for information on locations and times.

6 SATURDAY

Children's Arbor Day Celebration: "Treasure Hunt at the Arboretum

10 a.m. to noon, Shaw Arboretum. Attention, MoBots! Bring your whole family and a picnic lunch. Take a beautiful one-mile spring hike along the Wolf Run Trail and locate ten varieties of trees on your MoBot tree map. Enter the drawing located in the Visitors Center for a very special birdhouse. Free, for members only.

10 WEDNESDAY

Lecture: "The Evolution of a Garden in Northern Quebec"

1 and 7 p.m., Shoenberg Auditorium. Frank Cabot describes the evolution of his family's 20-acre garden over the past 65 years. Cabot has been a member of the Board of Managers of The New York Botanical Garden and recently founded the Garden Conservancy, a national organization dedicated to preserving exceptional private gardens for posterity. Free.

11 THURSDAY

Estate Planning Seminar

9 a.m., Ridgway Center. See April 4 for details.

15 MONDAY

Plant Clinic

9 a.m. to noon, Ridgway Center. See March 4 for details.

20 SATURDAY

Meg Webster Exhibit

9 a.m. to 5 p.m. daily through May 19, Ridgway Center. The Garden and Laumeier Sculpture Park sponsor a collaborative exhibit of two-dimensional works by environmental sculptor Meg Webster, including photographs and documents of past projects, and descriptive plans for the upcoming Laumeier Sculpture Park Prairie Project. Free with regular Garden admission.

20-21 SATURDAY & SUNDAY

Bonsai Society Show

9 a.m. to 5 p.m. daily, Ridgway Center. A display of exquisite examples of the art of bonsai. Free with regular Garden admission.

25-28 THURSDAY -SUNDAY

Spring Plant Sale

9 a.m. to 6:30 p.m. Thursday and Friday; 9 a.m. to 5 p.m. Saturday and Sunday; Garden Gate Shop. Members receive 20% discount on all merchandise! See page 19.

GARDEN WALKERS BREAKFAST
Every Wednesday and Saturday, 7 to 10:30 a.m.

The Garden opens early on Wednesday and Saturday mornings. The mileage of various paths around the grounds are available at the ticket counter. Health and nutrition programs will be offered the last Saturday of each month in cooperation with the American Heart Association; call 577-5125 for information. The Gardenview Restaurant offers its "heart healthy" breakfast buffet of cereals, fruit, juice, and yogurt. The greenhouses do not open until regular opening hours at 9:00 a.m. Admission is free before noon every Wednesday and Saturday.

WALKING TOURS
Every Tuesday, Saturday and Sunday 1:00 p.m.

Join the Garden Guides for a tour of the grounds, featuring the art, architecture, history and horticulture of the Garden. Meet at the ticket counter in the Ridgway Center. Free with regular Garden admission.

From the Membership Office

New Officers and Board Members Elected

At the annual meeting January 14, 1991, the Members' Board elected as officers (left to right): Jane Tschudy, second vice president; Sue Rapp, president; Ted Atwood, treasurer; Mary Longrais, first vice president; Susie Schulte, secretary.

Members elected to the Board (standing, left to right): Dr. Thomas Yager, Jean Crowder, Dale Whitten. (Seated, left to right): Ann-Marie Clarke; Robert Kresko, retiring president of the Board of Trustees; Linda Whitacre.

Special Preview Lecture for Lewis and Clark Tour

On Thursday, March 21, join tour guides Dr. Nancy Morin and Dr. Marshall Crosby of the Garden and Dr. Ray Bruen of the Riverlands Association for a lecture at 11 a.m. and 7:30 p.m. in Shoenberg Auditorium. The lecture highlights many of the wondrous natural and historical sights you will encounter on the Garden's co-sponsored tour June 14-28. You will follow in the footsteps of Lewis and Clark's famous ''Corps of Discovery'' expedition of 1803-06 along the Missouri River to the northwestern territories. Tour itineraries will be provided. You won't want to miss this exciting pre-tour lecture. Free, for members only.

Coming in May: A Garden Tradition

Mother's Day Luncheon at the Garden

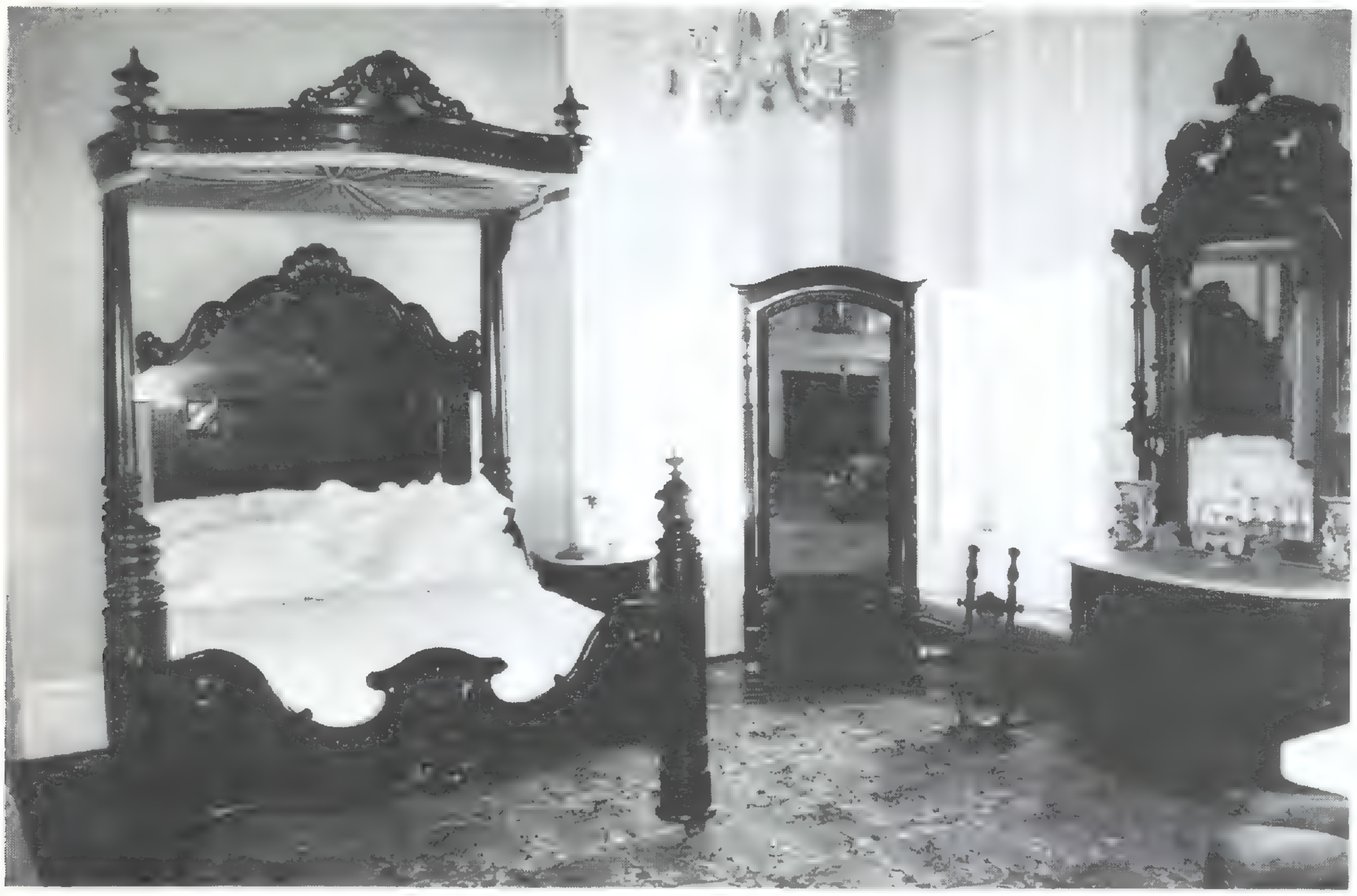
This popular celebration has become an annual spring event of the Garden. Mark your calendars now for Friday, May 10, 1991. Watch your April mail for a special members' invitation.

A Tribute to Family and Friends

You can recognize your family and friends at special times—birthdays, weddings, anniversaries, births, personal accomplishments, and as expressions of sympathy. When you make a tribute donation, a personalized acknowledgment of your gift, without reference to the size of the gift, is sent to the individual or family honored. In addition, both you and the honoree will be listed in the ''Tributes'' section of the *Bulletin*.

The donations to the Tribute Fund are a vital source of financial support for the Garden. You will receive a receipt for your records and each gift is tax deductible.

To make a donation, you may use the form at right. For more information about the Tribute Fund, or if you would like tribute remittance envelopes sent to you, please call our membership office at (314) 577-5118. Also, you can charge a tribute on your Visa or MasterCard.



The Mallard bed

NEWS FROM TOWER GROVE HOUSE

Restoration Project Continues

The magnificent carved canopy bed in the northwest guest bedroom in Tower Grove House has recently been completely restored. The bed was a gift to Tower Grove House from Mrs. L. Wade Childress in 1954. Although it is not marked, it is believed to be the work of Prudent Mallard, a renowned cabinetmaker established in New Orleans in 1838. Mallard was famous for his bedroom furniture. He introduced the style of a half-tester bed with magnificent carving, of which the bed in Tower Grove House is a splendid example.

The finish of the bed was restored by The Furniture Works, a St. Louis company. Martha Grimm, an expert textile conservator, replaced the deteriorating silk canopy, fringe, and dust cover after meticulous research. The bed restoration project was funded by the Tower Grove House Auxiliary.

The refurbished bed is just the latest part of the ongoing restoration of the upstairs bedrooms. An extensive analysis of the rooms' original paint has revealed that the door frames were painted to resemble stone, with ''false grain'' mahogany and oak finishes on the doors. The Historical Committee will use the findings of the paint analysis in planning future phases of the restoration.

Thank You, Volunteers!

The lovely Victorian Christmas decorations that beautified Tower Grove House in December were the work of dedicated volunteers. Deepest appreciation goes to the Tower Grove House Auxiliary; the St. Louis Herb Society; the Members' Board of the Garden; the Grass Roots Garden Club; the Twenty-Five Gardeners, Kirkwood; the Fleur de Lis Garden Club; the Four Winds Garden Club; the Ladue Garden Club; Joan Abeln, Bernadine McNeary, and the Tower Grove House staff.

Tower Grove House is decorated annually for the holidays. The participation of these organizations and individuals makes it a very special time for all.

Advance Admission Tickets Available

The Ticket Counter at the Ridgway Center has admission tickets available for purchase in advance. Adult admission is $2 for persons ages 13 to 64; senior citizen admission is $1 for ages 65 and over; and children age 12 and under are admitted free, as are Garden members. The Garden is open every day of the year except Christmas, and admission is free to all on Wednesdays and Saturdays until noon.

The tickets can be used on any future date, and make wonderful gifts. They can be purchased in person or by written request if a check or money order is enclosed. Send requests to: Ticket Counter, Missouri Botanical Garden, P.O. Box 299, St. Louis, Missouri 63166-0299. Admission for groups should be arranged by calling (314) 577-5124.

Tribute Fund—PLEASE PRINT:

The enclosed contribution to the Missouri Botanical Garden is given

In Memory of Mr./Mrs./Ms./Miss____________________

In Honor of Mr. / Mrs. / Ms. / Miss____________________

Occasion____________________

Notify: Mr. / Mrs. / Ms. / Miss____________________

Address____________________

City__________State________Zip________

From: Mr. / Mrs. / Ms. / Miss____________________

Address__________State________Zip________

City____________________

Please sign card:____________________

☐ My check for $__________ is enclosed.

☐ Please charge: ☐ VISA ☐ MasterCard

Amount: $__________

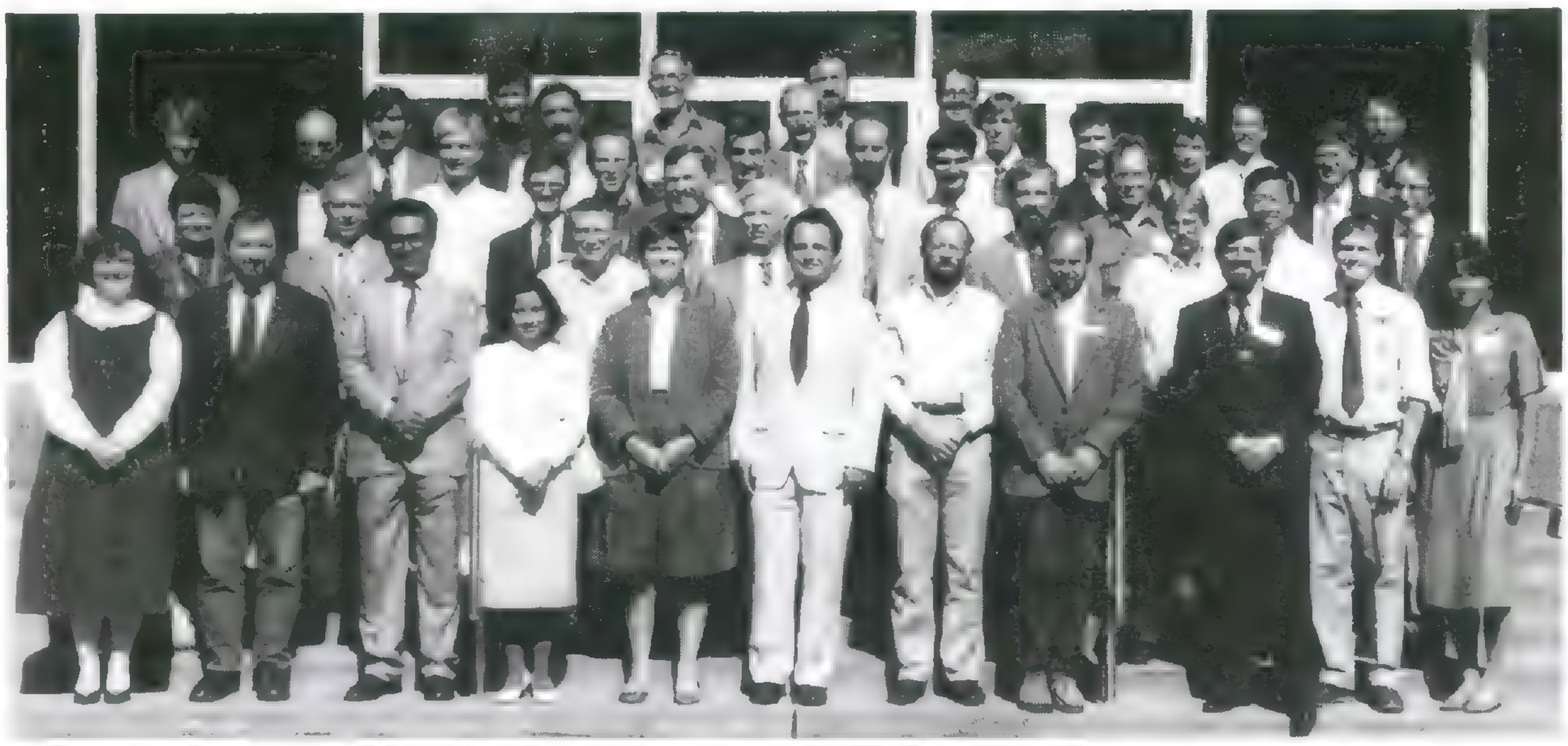
Account No.__________

Name on card:__________

Expiration date:__________

Signed:__________

Detach and mail to: Missouri Botanical Garden
Tribute Fund
P.O. Box 299
St. Louis, Missouri 63166-0299



In October, 1990, Garden research staff and visiting research scholars posed for a group portrait. A similar picture taken ten years ago had about a third this number, a tribute to the growth of the Garden's research program. (Front row, left to right): Nancy Morin, Fred Barrie, Ihsan Al-Shehbaz, Gloria Sousa-Andrade, Charlotte Taylor, Roy Gereau, Gordon McPherson, Jim Miller, Enrique Forero, Robbin Moran, Lois Brako. (Second row, left to right): Elsa Zardini, Peter Goldblatt, Mario Sousa, Bill D'Arcy, Jon Lovett, Henk van der Werff, Bill Haber, Bill Tai, Ron Liesner. (Third row, left to right): David Neill, George Yatskievych, Dale Johnson, Jim Solomon, Dan Harder, Gerrit Davidse, Al Gentry, Paul Berry, David Smith, Marshall Crosby. (Top row, left to right): Jim Zarucchi, Jeremy Bruhl, Fernando Zuloaga, Job Kuijt, W. Douglas Stevens, Mick Richardson, Peter Hoch, John MacDougal, Tom Croat, Bruce Allen, George Schatz, Bob Magill. Sousa and Zuloaga are MBG postgraduate fellows; Bruhl is a postdoctoral fellow; Harder is a MBG research associate; Sousa-Andrade is a visiting researcher.

(Left to right): Dr. P. Mick Richardson, manager of graduate studies at MBG; Carolina Israel; Mrs. James A. Breckenridge; Germán Carnevali; and Dr. Victoria Sork, director of graduate studies in biology at UM-St. Louis.

Garden Clubs Support Graduate Students

The Federated Garden Clubs of Missouri, represented by Mrs. James A. Breckenridge, recently gave scholarship awards to two of the graduate students in the Missouri Botanical Garden/University of Missouri-St. Louis joint program. The recipients were Carolina Israel, a native of Peru studying tropical forest soils, and Germán Carnevali, a native of Venezuela who studies orchids.

Garden To Be Major Force at African Botany Congress

The Missouri Botanical Garden will be a major presence at the 13th Congress of the Association for the Taxonomic Study of the Flora of Tropical Africa (AETFAT) [Association Pour l'Etude Taxonomique de la Flore d'Afrique Tropicale] to be held in Zomba, Malawi, April 2-11, 1991. Through the generosity of two donors, Mrs. Clark Gamble and the Monsanto Fund, the Garden will be able to send five of its botanists to the Congress and fund the travel of five additional African botanists from their home countries.

AETFAT was founded in London in 1950. Its membership is open to anyone who is interested in the flora and vegetation of Africa. Of its 800 members, some 300 are expected to attend the Malawi Congress. In the 40-year history of the organization, this will be the first time that an AETFAT Congress will be held in tropical Africa. The most recent meeting was held in 1985 at the Missouri Botanical Garden.

"This is the most important meeting of botanists and ecologist working in tropical Africa," said Dr. Peter Goldblatt, B. A. Krukoff Curator for African Botany at the Garden. "It is the only time that these people can get together to exchange information, renew old acquaintances, make new contacts, and get all fired up about botany."

Mrs. Clark Gamble's donation will be used to fund the travel of Garden research staff. The Monsanto Fund donation will go toward the travel of the African botanists.

Garden botanists who will attend are Robert Magill, Roy Gereau, and Goldblatt traveling from St. Louis; Porter P. Lowry II, who coordinates the Garden's Madagascar research program, traveling from Paris; and Jon Lovett, the Garden's resident botanist in Tanzania. Since 1970, the Garden has been the designated center for the study of African botany.

The African botanists will be traveling to Malawi from Cameroon, Gabon, Ghana, Ivory Coast, and Tanzania.

NSF Awards Grant to Flora of North America

The National Science Foundation (NSF) has awarded $600,000 in a three-year grant to the Flora of North America project. Flora of North America, whose organizational center is here at the Garden, involves hundreds of botanists in North America in the production of the twelve-volume, illustrated work and an associated database. The Hunt Institute for Documentation in Pittsburgh, Pennsylvania, is the bibliographic center.

The current NSF grant supports work of editors at their home institutions, administrative activities, and writing of some treatments. Flora of North America received its initial funding from The Pew Charitable Trusts in 1986. The National Science Foundation awarded the project a grant of $300,000 for two years in 1987; the current grant represents renewed funding for the project.

Trustee Profile

Buzz Westfall

Buzz Westfall became a member of the Garden's Board of Trustees in January when he assumed the position of St. Louis County Executive following the November election. Both the St. Louis County Executive and the Mayor of the City of St. Louis serve as ex-officio members of the Garden's Board. "I am enthusiastic about this appointment and believe that the Garden is a fantastic asset to the metropolitan area," said Westfall.

A resident of St. Louis County since childhood, Westfall attended parochial schools and graduated from St. Louis University Law School in 1969. Following the completion of his education, he became an Assistant Professor in the St. Louis County Prosecutor's Office from 1969-1977. In 1978, Westfall was elected St. Louis County Prosecuting Attorney and served in that capacity until the present.

Among this top priorities as County Executive Westfall has stressed his commitment to maintaining a tough stand on crime, working for greater protection of our environment, and keeping St. Louis County's economy strong by retaining jobs and attracting new ones to the areas. "It is imperative that we take an active role in preserving our environment for our own survival and in order to make the world a better place for future generations. Working with the Missouri Botanical Garden, I anticipate having a great opportunity to create cooperative programs between the county and the Garden that will be beneficial to the entire area," Westfall said.

Westfall and his wife, Laurie reside in DesPeres with their three children: Mark, Steve, and Kristin.

NEWS FROM THE HENRY SHAW ACADEMY

Spring Programs Focus on Gardening, Outdoor Adventures

The Academy programs this spring will offer extraordinary opportunities in gardening, exploring various natural communities, and outdoor studies. Classes on Saturdays and Tuesday afternoons include butterfly gardening, endangered species, weather forecasting, cave explorations, "planting trees for wildlife cover," Shaw Arboretum wildflower treks, "planting a prairie," the Stream Ecology spring field trip down the Meramec River, and much more. For more information about the Henry Shaw Academy and current programs for ages 7-14, call the instructional coordinator, Jeff DePew, at 577-5135.

Moving? Please Remember To Send Us Your New Address.

To avoid missing any of your membership mailings, you *must* give us your new address at least three weeks *before* you move. Please enclose the mailing label on the back cover of this *Bulletin*, and mail to: Membership Office, Missouri Botanical Garden, P.O. Box 299, St. Louis, MO 63166.

Archives Receives NHPRC Grant

The Garden library has received a grant for $80,096 from the National Historical Publications and Records Commission (NHPRC) with the approval of the Missouri Historical Records Advisory Board. The purpose of the grant is to develop the Garden archives program for non-current records, and to begin a records management program for current records.

All aspects of the Garden are reflected in the archives, which includes publications, records, blueprints, photographs, and personal papers. Taken together, these archival materials tell the story of the growth and building of the Garden. The grant project includes appraisal and preparation of permanently valuable records for transfer to the archives; arrangement and description of records; placement of records descriptions into an automated database; and publication of a guide to the archives collection.

The archives preserves only a small percentage of the Garden's non-current records. Fortunately, not everything needs to be saved, considering the enormous amount of paper that modern institutions generate. Records management through records scheduling allows timely destruction of those records that are not permanently valuable, so that space and equipment once used to store outdated records can be more efficiently used. Records scheduling also insures that permanent, inactive records are preserved and transferred to the archives; this transfer releases prime office space. Records schedules are made by collecting data on the Garden's records in a records survey and recording decisions made by department heads and the archivist on how long these records will be kept.

This project will be carried out January 1, 1991 to December 31, 1992 by the Garden archivist, Martha Riley, with the assistance of grant supported staff members Suellyn Lathrop and Mary Stiffler.

Congratulations, Climatron!

The new telephone directory white pages for St. Louis features the Climatron on its cover. Our thanks to Southwestern Bell!

Project ReDirectory Aims To Save 18,000 Trees

RECYCLE
YOUR OLD PHONE BOOKS HERE

Above: At the Project ReDirectory announcement held at Spink Pavilion at the Garden, students from Ferguson Middle School K.I.N.D. (Kids in Nature's Defense) Club and Girl Scouts from Troops 141 and 386 stacked 32 telephone directories to underscore the high priority school-aged children place on environmental efforts. Recycling a four-foot stack of phone books saves one 10-year old, 60-foot high Southern Pine tree. Pictured left to right are: Jamina Randall, Stephanie Kilcrease, Cedric Johnson and Adam Koeneman.

Southwestern Bell Telephone Company announced its ReDirectory telephone book recycling program for the St. Louis area at a news conference held at the Garden on January 16. The St. Louis effort is the largest phone book recycling project ever undertaken in the midwest. Douglas Arnold, the Garden's public relations manager, served on the steering committee of environmental organizations and area corporations that helped Southwestern Bell organize the project. The coalition includes BFI Waste Systems, General Motors Corporation, Henry Transportation, Inc., St. Louis Area Girl Scout Council and the St. Louis Post-Dispatch.

Between March 23 and April 13, St. Louisans can bring their old telephone books to one of over 100 collections sites all over the metropolitan area. Collection sites include the lobby of every Dierbergs Family Market, every McDonald's restaurant listed in the St. Louis Yellow Pages, every St. Louis City firehouse, and the City's Operation Brightside Circus Recycling Center at 1600 South Kingshighway.

The outdated books will be shredded and recycled to make paper towels, bathroom tissue, building, insulation and drywall. Among the paper companies recycling the phone books is Fort Howard Paper Company of Muskogee, Oklahoma, from whom the Garden purchases the recycled paper towels and toilet tissue it uses in all its receptacles.

Southwestern Bell expects to save nearly 18,000 trees and 3,465 cubic yards of landfill space this year by collecting and recycling 600,000 area phone books, or 30 percent of the 2 million books distributed yearly. ■

Flower Festival Is April 27 and 28

A little-known bequest by the Garden's founder Henry Shaw has grown to become the annual Flower Festival at Christ Church Cathedral (Episcopal) in St. Louis. The Festival is held the last weekend of April each year. This year's dates are April 27 and 28.

Henry Shaw attended Christ Church Cathedral for many years and was a personal friend of Bishop Charles F. Robertson. Shaw's funeral was held at the Cathedral on August 31, 1889. In his will, Shaw bequeathed money annually to the Bishop of the Missouri Diocese to pay for a minister of his choice to preach a sermon each year in the Cathedral "on the wisdom and goodness of God as shown in the growth of flowers, fruits, and other products of the vegetable kingdom."

The first "flower" sermon was preached in the Cathedral on Sunday, May 18, 1890. A sermon has been delivered each year since then except 1950 and 1951. Over the years many famous preachers have delivered the annual sermon, as have the laity, including directors of the Garden.

Church members began bringing flowers to decorate the Cathedral on Flower Sundays in 1902. The Missouri Botanical Garden has provided flowers to decorate the Cathedral since 1937, when it donated some 200 plants. Today the Garden donates over 1,000 plants, coordinated by Garden horticulturist Steve Wolff.

Flower Sunday turned into a Flower Festival weekend, starting with a street fair, in 1974. Highlights of the weekend include booths from the parishes of the Missouri Diocese: foods, crafts, games, books, flowers and plants, gardening supplies, balloons, clowns, and music. Special concerts are presented in the Cathedral both Saturday and Sunday. Other attractions for this year are still in the planning stage.

Each year the proceeds from the Street Fair benefit a worthy cause. In 1990 the Gateway to Gardening Association was one of the recipients. This year The Hunger Fund, administered by the Task Force on Hunger and Homelessness of the Episcopal Diocese of Missouri, will be the recipient. All money received by The Hunger Fund is used to buy food for the hungry in Eastern Missouri.

This year marks the 150th anniversary of the Episcopal Diocese of Missouri. This year's festival theme is "150 Years of Caring and Sharing." The public is invited to attend any of the events of the Flower Festival and view the outstanding display of flowers provided by the Missouri Botanical Garden. For further details, call Christ Church Cathedral at 231-3454. ■

Energy Efficiency Loan for Ridgway Center

The Garden has received a loan from the Missouri Department of Natural Resources to upgrade the energy systems of the Ridgway Center under the Local Government Revolving Loan Program. The program was established to improve energy efficiency in public facilities. The low interest loan of $175,964 will be repaid from the savings generated by the improvements.

The Ridgway Center was opened in 1982 with heat pumps using a hydraulic water loop system. Over the years it has become apparent that certain control features of the building could be improved. The upgrade plan has three components: a computerized management system for the building's existing heat pumps; variable speed controls on fans for air circulation in the Orthwein Floral Hall; and motorized solar shades for the skylights in the floral display area.

"These improvements will certainly help to reduce the amount of energy we use at the Ridgway Center," said Paul Brockmann, director of general services. "That is an important part of our ongoing efforts for environmental responsibility."

Metasequoia glyptostroboides *behind Tower Grove House.*

Hamel Family Gift To Protect Dawn Redwoods

The three children of Mr. and Mrs. Ellis H. Hamel have made a substantial family gift for the protection and preservation of the Garden's dawn redwood tree collection. The gift in memory of Ellis and Lessie Hamel will be used to care for the eight magnificent trees on the east side of the Lehmann Building. Last fall one of the trees was struck by lightning, and the gift will cover installation of a system of lightning rods to protect the entire group.

The dawn redwoods, *Metasequoia glyptostroboides*, are some of the most beautiful and intriguing trees at the Garden. In 1941 the species was identified from fossils and was thought to be extinct until 1946 when specimens found growing in a remote mountain area of China were identified. The Garden's dawn redwoods grew from seeds that arrived here in 1947. They were germinated and the seedlings were planted in their present location in 1952. The oldest known *Metasequoia* has lived about 420 years. The largest trees reach over two meters in trunk diameter and stand over 50 meters tall.

Lessie Hamel served as a guide in Tower Grove House for many years and had a deep and abiding affection for the Garden. Her children's gift will help ensure that these lovely trees will endure.

Gift Planning

Estate Planning Seminar

In your estate plan, you can be the director—you can decide the disposition of your property. You can provide for your spouse and children, put aside funds for your children's education, establish trusts for the care of adults who are—or who you suspect may become—incapacitated due to age or illness. There are also methods by which you can include your favorite causes in your estate plan, reducing and in some cases eliminating gift and/or estate taxes.

The concepts of estate planning and providing for the people and institutions you love will be the focus of the two-part seminar that will be held at the Garden on April 4 and April 11, 1991, at 9 a.m. in the Garden Room at the Ridgway Center. The programs will be presented by Matthew G. Perlow, attorney with Peper, Martin, Jensen, Maichel and Hetlage; Mary Key Schumacher, financial planner with IDS Financial services; and Sonja Nelson, manager-personal trust marketing of Commerce Bank. Each expert will provide a distinctive viewpoint about the benefits of financial and gift planning.

While the morning sessions are a two-part series, it is not necessary to attend both, but a reservation is necessary. If you have questions or wish to make a reservation, please call Ernestina Short at 577-9532.

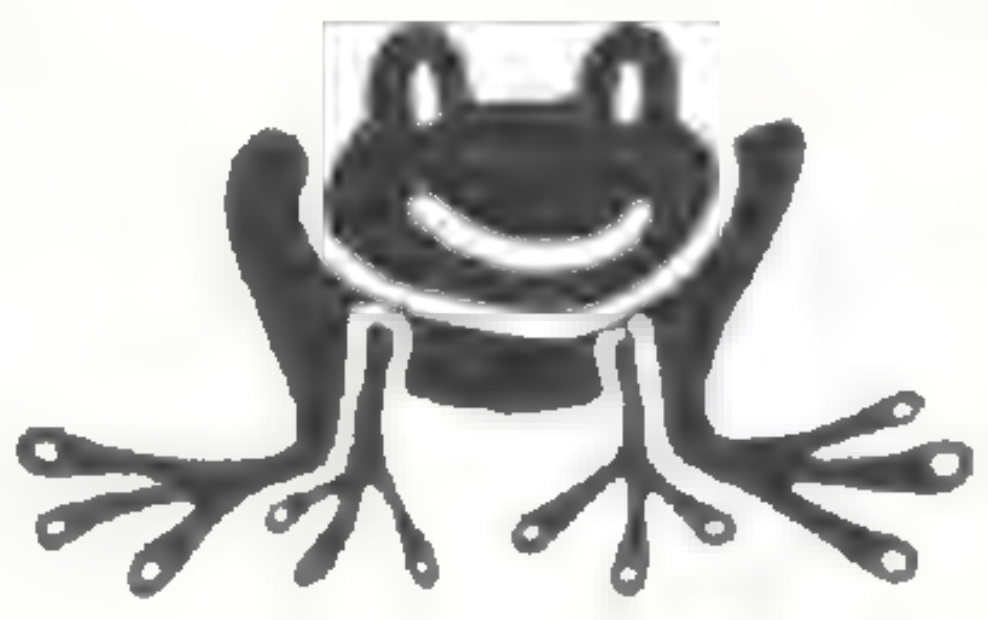
From the Garden Gate Shop

Spring Is Just Around the Corner!

As you plan your spring garden, be sure to include a trip to the Garden Gate Shop. Choose from the Shop's vast assortment of gardening books, including the complete sets of Ortho and Brooklyn Botanic Garden publications. The Shop has just the right tools, gardening equipment, seeds, statuary and outdoor giftware to make the most of your garden and patio this season.

Easter Is Early

This year Easter will be celebrated in March—the 31st! The Shop has Easter cards, candy, blooming plants and charming Easter decorations, everything you need to make your holiday special.



New at the Shop

The Shop has its own mascot—an *exclusive* tree frog design, a gentle reminder of the endangered tropical rain forests and the fragile life within.

The whimsical frog decorates the Shop's handsome neckties, leather trimmed button-on suspenders, and ceramic mugs. The poly-silk ties are available either in a conventional style or as a self-tie bow tie. All items have a deep cobalt blue background highlighted by the bright green frog with his red eyes, yellow toes and tiny smile. The mug also displays the Garden logo, and all make splendid gifts.

Annual Spring Plant Sale

April 25-28, 1991
Thursday & Friday: 9 a.m. to 6:30 p.m.
Saturday & Sunday: 9 a.m. to 5 p.m.

On Thursday, opening day, the Shop will offer a special feature for members only, on a first-come, first-served basis: a selection of special and unusual plants cultivated from the MBG living collection by Garden horticulture staff. Enjoy 20 percent savings on all merchandise in the Shop, all four days, especially the huge selection of bedding plants, perennials, roses, begonias, geraniums, azaleas and herbs. Take advantage of a special purchase of Rapid-gro plant food: buy one, and get one free. The sale opens to the public on Saturday, April 27. Come early!

Howard A. Schneiderman

1927-1990

Dr. Howard A. Schneiderman, a Garden Trustee since 1981, died December 5, 1990. He was chief scientist and senior vice president of research and development at Monsanto Company. Dr. Schneiderman joined Monsanto in 1979, and under his leadership the company built its Life Sciences Research Center for biotechnology research in Chesterfield, Missouri.

Dr. Schneiderman was an internationally renowned scientist. He came to Monsanto from the University of California, Irvine, where he was dean of the school of biological sciences and director of the center for pathobiology. He was appointed to the National Science Board by President Reagan in 1987, held seven honorary degrees, received numerous national and international awards, published more than 200 scientific papers, and served with distinction on many boards of directors and professional associations, including the National Academy of Sciences. He was a graduate of Swarthmore College and earned his master's and doctoral degrees from Harvard University. At the time of his death he was an adjunct professor of biochemistry and biology at Washington University in St. Louis.

Dr. Schneiderman brought his scientific brilliance and leadership to his service at the Garden. On joining the Board of Trustees in August, 1981, he said, "Quite apart from civic reasons, I have a very deep interest in the preservation of resources and genetic diversity. The Garden is a place where strategies for the future will be made; it's one of the world's most important institutions. Being a member of the Board will provide an opportunity for me to work with members of the community on matters that are important to the community and beyond it."

Dr. Peter H. Raven said, "Howard Schneiderman was an unfailing optimist who infected everyone with whom he came into contact with his cheerfulness, his devotion to science and to the truth, and his students and colleagues, both in universities and later at Monsanto benefited from his special qualities."

Sam'l C. Davis

1910-1990

Friends and staff of the Garden were saddened by the recent death of Mr. Sam'l C. Davis, a longtime member of the Garden's Board of Trustees. Mr. Davis was elected to the Board in 1960 and served until 1977, when he was named Emeritus Trustee. He followed his father Samuel C. Davis, who served on the Garden's Board from 1920 to 1940.

Mr. Davis, a native St. Louisan, retired as an executive vice president from the St. Louis Union Trust Company in 1969. He began his career with the company in 1935. Mr. Davis was active on the Garden's Board as a member of the business committee, and he made a substantial contribution to the Garden's progress during his tenure. He will be deeply missed.

Tributes NOVEMBER-DECEMBER 1990

In Honor Of

Mrs. Teel Ackerman
Mr. and Mrs. Bert Schweizer II
Mr. and Mrs. Adrian N. Baker II
Mr. and Mrs. James E. Schneithorst
Almira Baldwin
Mr. and Mrs. Henry O. Johnston
Philip E. Bauer
Mr. and Mrs. Paul C. Baichly
Mr. and Mrs. John R. Belz
Mr. and Mrs. James E. Schneithorst
Dr. Harry Berland
Dr. and Mrs. Harold M. Cutler
Mr. and Mrs. Leonard Bierman
Mr. and Mrs. Bernard A. Barken
Mr. and Mrs. Harry Bobroff
Mrs. Laura Mae Cassel
Dr. James Bobrow
Dr. and Mrs. M. Kenton King
Ruth E. Buerke
Mary Armantrout
Gerry Ball
Mary Brommelhorst
Mary Dowling
Ellen Hogan
Gen Kammien
Mr. and Mrs. Leon Callanan
Mrs. Betty Wamble
Dr. and Mrs. David Caplin
Dr. and Mrs. John Hirsch
Mrs. Joseph Chasnoff
Mr. and Mrs. Edward F. Ruprecht
Cindy and Doug
Mr. and Mrs. Ronald Prince
Mr. and Mrs. Michael Courtois
Ms. Karen Heege
Mr. Toichi Domoto
Dr. and Mrs. Douglass T. Domoto and Alyson
Mr. and Mrs. Henry Dubinsky
Mr. and Mrs. Robert W. Meyers
Mrs. Mildred Eisenkramer
Mr. and Mrs. Richard Halpern
Mr. and Mrs. J. Curtis Engler
Mr. and Mrs. James E. Schneithorst
Kathie and George Euson
Mr. and Mrs. H. O. Monahan
Cherie and Bert Finkelstein
Mark E. and Maria J. Weingartner
Mr. and Mrs. William Firestone
Mr. and Mrs. Joseph O. Losos
Four Seasons Garden Club
Anonymous
Mr. and Mrs. Sam Fox
Mr. and Mrs. James E. Schneithorst
Ms. Nancy Frauhiger
Ms. Christine Gott
Mrs. Audrey Friedman
Mr. and Mrs. Sam Rosenbloom
Mr. and Mrs. Christopher Gilson
Mr. and Mrs. Lloyd W. Hager
Mr. and Mrs. Courtney A. Gould
Mr. and Mrs. Bernard A. Barken
Mr. and Mrs. Richard T. Grote
Mr. and Mrs. James E. Schneithorst
Pat Gruenewald
Dr. Harvey Rhoads
JoAnn VonBergen
Steve Wells
Mr. and Mrs. Robert R. Hermann
Mr. and Mrs. James E. Schneithorst
Mr. Fielding L. Holmes
Mr. and Mrs. James E. Schneithorst
Mr. and Mrs. John A. Holmes Jr.
Mr. and Mrs. James E. Schneithorst
Mr. and Mrs. Sidney G. Holthaus Jr.
Mr. and Mrs. James E. Schneithorst
Dr. and Mrs. S. J. Hotze
Mr. and Mrs. G. P. Hentschke
Mrs. Ann Husch
Louise and Fred Goldberg
Ms. Linda Hutson
Ms. Kathryn G. Ellis
Mr. and Mrs. Jay Israel
Mr. and Mrs. H. Lynn Boardman
Mrs. Stanley F. Jackes
Mr. Stanley Mulvihill
Miss Constance Franchot James
Mrs. Edward W. Fordyce
Bruce and Rosemarie Kaemmerlen
Garden Appreciation Club
Mrs. Toby Katz
Mr. and Mrs. Bernard H. Sirkin

Dr. and Mrs. Maurice Keller
Mr. and Mrs. Joseph O. Losos
Mr. and Mrs. W. Van Beuren King
Mr. and Mrs. James E. Schneithorst
Mr. and Mrs. Martin Koshner
Dr. and Mrs. Arthur E. Carlson
Mr. and Mrs. Harold Kravin
Dr. and Mrs. Milton Kardesch
Mr. and Mrs. C. J. Krings
Mr. and Mrs. Arthur J. Krings Jr.
Sally Leavitt
John Salmon
Mr. and Mrs. Richard W. Baizer
Mrs. Ceceila Lefkowitz
Mr. and Mrs. Phillip Schreiber
Mrs. Lainey Lortz
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Chilly Scenes of Winter

Inside, the Climatron sheltered a warm tropical rain forest, but outside, the Garden was locked in ice and snow throughout December and January. It's nice to know that spring is just around the corner.

—Photo by King Schoenfeld

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CENTER FOR HOME GARDENING
MEMBERS' PREVIEW JUNE 8
OPEN TO THE PUBLIC JUNE 9

VOLUME LXXIX
NUMBER THREE

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This new building opens in June with an exciting array of facilities, features, and displays.

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On the cover: *The beautiful interior of the Kemper Center seems to bring the outdoors inside.*
—Photo by Richard Benkof

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Comment

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A Fanfare for Spring and Summer

Gardens bring forth the greatest enjoyment, satisfaction, and beauty during spring and early summer when the fruits of any gardener's labor become obvious. For the past several months, Garden staff have been working against the clock to prepare for the opening of the new Kemper Center for Home Gardening, the first step in giving St. Louisans the largest and most varied home gardening resource in the country. Amateur and professional gardeners alike will find practical information available on almost every gardening topic when the Center opens on June 9. Members will be among the first to see the Center at the preview on June 8.

Among the exhilarating features of spring and summer are the traditional Garden events. The Mother's Day luncheon planned with Dillard's for May 10 offers a delightful afternoon at the Garden (see page 15). Rose Evening, one of the most enjoyable spring traditions for decades, gives members the opportunity to talk with the Garden's horticulture staff about growing roses and other plants (see page 12). In late June, the ever-popular musical evening attracts all ages to a performance under the stars on Spoehrer Plaza.

This summer, three unprecedented activities will be launched, two that will hopefully become part of the Garden's traditional events. On the 4th of July, the Garden and Tower Grove Park are hosting an "Old Fashioned 4th" for St. Louis. If you are looking for the perfect day to enjoy family and friends, food and good patriotic music and bands, then plan to join us on the 4th.

For years August has been the month of the Japanese Festival. This year we are presenting an exciting new program, the Festival of Festivals, featuring a different country each weekend. Ethnic food, music, cultural exhibits, and performances from Japan, England, Greece and the Caribbean will highlight each weekend starting on August 1. Watch for additional information about the festivals soon.

Finally, the Garden cordially invites you to join in welcoming the new Lord and Taylor Department Store to the St. Louis Galleria at a Benefit for the Garden on Wednesday, July 24. A fabulous party with the opportunity to be the first to shop at Lord and Taylor, wonderful entertainment and special gifts are just a few of the surprises for the evening. Make your reservations early so you can be in on the fun (see page 14).

I look forward with enthusiasm to your participation in the months ahead.

Peter H. Raven

L. A. KELLY

COMING IN AUGUST—"Festival of Festivals"

This summer the Garden will celebrate the cultures of Japan, England, Greece and the Caribbean in a month-long gala. Four exciting weekends will bring entertainment, music, folk dancing, games, crafts, displays, lectures, food and more, with each weekend devoted to a different country. From Scottish bagpipers to Greek folk dancers to steel drum musicians to Japanese kite makers, there will be something for everyone. Mark your calendars now and watch for more details!

RICHARD BENKOF

A Dream Fulfilled

A year and one month after the first shovelful of earth was turned, five months ahead of schedule, the William T. Kemper Center for Home Gardening will open to the public on Sunday, June 9…

MISSOURI BOTANICAL
APR 26 1991
GARDEN LIBRARY

Preceding page: Members' Board president Sue Rapp and Steven D. Cline, manager of the Center, greeted members at a special preview on March 20. The photographs for this story were taken that day; when the Center opens in June, all displays and facilities will be in place.

CENTER FOR
HOME GARDENING

Above: The residential style of the architecture gives the Center a home-like feeling. This cozy fireplace nook will be a comfortable reading area for perusing catalogs of gardening supplies. The eastern exposure will feature appropriate houseplants. At left: a young visitor investigates the completely equipped demonstration kitchen on the lower level.

THE WILLIAM T. KEMPER CENTER is the final achievemen of the recently completed capital fund drive and the realization of a dream that began in 1973 with the Garden's Master Plan.

"There is no other facility like this in the United States," said Steven D. Cline manager of the Center. "What we're doing has never been attempted on this scale."

The Center for Home Gardening will be a comprehensive teaching facility for home gardeners. The beautiful residential-style building, designed by Louis R. Saur & Associates of St. Louis, houses an exciting array of displays and demonstration facilities in a dynamic living space. Visitors will receive direct one-on-one attention and practical advice from the staff and Master Gardeners, plus access to a huge selection of up-to-date information on general gardening. Eventually the new building will be surrounded by 20 outdoor display gardens.

"We are delighted and deeply grateful that so many good friends, through their generous gifts, have joined us in making the Kemper Center a reality," said Peter H. Raven at the groundbreaking ceremony May 8, 1990. "In addition to the William T. Kemper Foundation, we wish to acknowledge the magnificent support of other major donors, including the Monsanto Fund, Mr. and Mrs. Henry Hitchcock, Dr. and Mrs. Walter Moore, the James S. McDonnell Foundation, Mrs. James S. McDonnell, the Stanley Smith Horticultural Trust, the Spencer T. and Ann W. Olin Foundation, and the Federated Garden Clubs of Missouri." Raven added, "Mr. and Mrs. Stanley Jackes, Mr. and Mrs. Joseph Bascom, Mrs. Albert Blanke, Jr., Times Mirror, Mosby-Year Book, Inc., Mr. and Mrs. Herbert Condie, Jr., KTVI, The Sporting News, and Mrs. Thomas Shields also made significant contributions to the Center."

Facilities

Visitors entering the upper level of the Center will feel that they have entered a lovely private home. Just inside the main entrance is an area for displaying current catalogs of gardening supplies, comfortably arranged in a living room-style nook with windows flanking a fireplace. The central atrium will feature seasonal displays of plants, changing each month. A book reference area, also on

RICHARD BENKOF

Above: Answer Man Chip Tynan (left) mans the phone at the Plant Doctor desk. Glenn Kopp, coordinator of adult education and the Master Gardener program, looks on. The Plant Doctor desk will be staffed by Master Gardeners, and will have a bank of video screens above. The demonstration potting room and the Center's energy efficient greenhouse are located nearby. The greenhouse (at right) commands a sweeping view of the grounds to the south and will be used to propagate plants for use in demonstrations.

CENTER FOR
HOME GARDENING

the upper level, will give gardeners access to a complete selection of up-to-date horticultural information, including computerized directories of plants, plant societies, area nurseries, and a catalog of books available at the Center and for purchase in the Garden Gate Shop.

Descending the stairs to the next level, gardeners will discover a beautiful greenhouse ''garden room'' that doubles as a propagation facility. The Plant Doctor desk, demonstration potting room, and more living displays complete the center level, which also has direct access to the outdoor garden areas.

The lower level of the Center houses a large demonstration kitchen/classroom with space for 75-100 people. The room is equipped with video projectors and a screen and can be used as a television studio for filming demonstrations.

Energy Efficiency

The entire building is designed to take advantage of energy efficient technology ideal for homes. The greenhouse can act as a solar collector that traps warm air in winter to be vented into the rest of the building. To reduce solar radiation and heat in summer, the greenhouse is equipped with shade cloths on tracks. An additional shade system is provided by exterior louver panels in the upper clerestory windows. The shading and venting systems are all tied into the building's automated environmental monitoring system designed to regulate heating and cooling efficiently.

What the Garden is doing has never been attempted on this scale.

Displays and Programs

In addition to its rotating seasonal displays of living plants, the Center features permanent exhibits of indoor plants growing in north, south, east, and west exposures. All displays will include wall panels, signs, and informational handouts. ''Three Months at a Glance'' calendar wall panels provide timely gardening tips.

The Plant Doctor desk has three rear projection video screens mounted over-

Master Gardeners Rienette Diller (left) and John Stephens at a recent Plant Clinic.

MASTER GARDENERS
ASK US

CLIFF WILLIS

St. Louis Master Gardeners

THE St. Louis Master Gardeners make an extraordinary commitment of time, energy and expertise to gardening projects throughout the community. In 1990 the 109 active Master Gardeners volunteered 11,300 hours of service to schools, homeowners, community organizations and senior citizen's groups.

One of the Master Gardeners' most ambitious projects is the School Gardening Program, a collaborative venture of the Garden, Gateway to Gardening Association, and St. Louis Public Schools Partnership Program. It provides elementary school students with an opportunity to raise a vegetable garden at their school. The 600 participating students learn how plants grow, what conditions they need to flourish and how we are all dependent upon plants. They also experience the beauty of plants and the joy and satisfaction that can be had through gardening.

Master Gardeners are assigned to schools where they help classes to organize and implement a series of activities throughout the school year, culminating in a harvest of their crops in June. The program is coordinated by Master Gardeners Maxine Schuler and Helene Holwerda, assisted by Kitty Hoblitzelle.

In The ''Don't Bag It'' Program, Master Gardeners work one-on-one with homeowners to encourage people to leave grass clippings on their lawns. The results in 60 demonstration lawns in St. Louis County have helped to reduce solid yard waste and created healthier grass as well.

Master Gardeners also teach classes and act as speakers for the Samuel D. Soule Center for Older Adults, nursing homes, retirement centers, and senior citizens' clubs. They have an on-going project to maintain and develop the landscaping at the Stupp Memorial Center in Tower Grove Park.

Master Gardeners serve as troubleshooters at Plant Clinics, fielding over 28,000 questions annually for the Garden's Horticultural Answer Service. They also staff the University Extension Lawn and Garden Hotline. All these services are free to the public. Plant Clinics offer expert advice of professional gardeners from the Garden, University Extension, city, county, and state agencies, assisted by Master Gardeners supervised by John Stephens and Marshall Magner.

Master Gardeners must complete 45 hours of training to earn Level I status. In 15 3-hour sessions they study plant growth, gardening techniques, lawn care, and how to grow indoor plants, fruits, flowers, trees and shrubs.

Level II certification requires an additional 45 hours of study on diagnosis and treatment of plant problems. Bi-monthly seminars keep the graduates up-to-date.

The program is coordinated and training is provided by instructors from the Garden and University Extension. A steering committee of six elected Master Gardeners meets monthly with Garden and Extension coordinators. The program was begun by University Extension in 1981, and in 1983 it was organized as a joint program with the Garden. Since that time, 173 volunteers have been trained.

Glenn Kopp, the Garden's coordinator of adult education, and John Whelan, horticulture specialist at the University Extension's St. Louis office, supervise the Master Gardener Program. ''It's a privilege to work with the Master Gardeners,'' said Kopp. ''Their commitment of energy, time, and expertise is extraordinary. We couldn't accomplish our programs without them, and they have fun doing it!'' ■

A Dream Fulfilled

continued from page 6

head. The screens will show a continuous series of short programs on gardening topics, weather information, and seasonal updates. The video displays can be interrupted with views of material under the Plant Doctor's microscope or live demonstrations taking place elsewhere in the Center. The video displays can be remote controlled by the building's central computer system. Interactive computerized displays will be added in the future.

Master Gardeners will staff the Plant Doctor desk, providing technical information and a regular schedule of clinics. The Demonstration Potting Room provides space for small classes to get ''hands on'' experience mixing soils, pruning, fertilizing and potting plants grown in the greenhouse.

The Center also will offer a comprehensive soil testing program. It will further serve as a central facility for many adult education classes.

A Gardening Coalition

The Center for Home Gardening is staffed jointly by the Missouri Botanical Garden and University Extension. Master Gardeners, who volunteer thousands of hours each year, (see box at left) will provide substantial support. University Extension exists in all 50 states to make agricultural and horticultural research readily available to the public. In Missouri, University Extension has an office in every county, and is administered through the University of Missouri System and Lincoln University.

Together with the Gateway to Gardening Association (GTGA), which promotes the Urban Gardening Program in St. Louis (see the *Bulletin*, November-December 1989), the Garden and University Extension will form an Urban Gardening Coalition with extensive outreach into the community. In the near future, the GTGA administration also will be located here at the Garden, and together the coalition will provide a newsletter and cooperative programs.

Saturday, June 8 will be a special all-day preview of the Center just for Members. ''We hope that the entire St. Louis community is as excited as we are about the Center,'' said Dr. Cline. ''Realizing this dream would not have been possible without the support of the membership. We're looking forward to helping everyone take a bit of the beauty they see here home to their own gardens.'' ■

Corporate Philanthropy Profile

The Emerson Electric Company Charitable Trust

In 1987 Emerson Electric Company, through its charitable trust and directly from the corporation, contributed more than $6,920,000 to non-profit organizations nationwide. As Emerson's world headquarters location, St. Louis has benefited inestimably from the company's longstanding record of philanthropy.

O. Sage Wightman III, president of the Garden's Board of Trustees, observed, "Emerson is a national corporate leader in its commitments to higher education, social services, and civic and public affairs, and in encouraging its employees to be philanthropists by means of its matching gifts program. I think it especially important to point out that Emerson makes substantial contributions, totaling 11.2 percent of its grants budget, almost exclusively to arts and humanities institutions in the St. Louis area. The impact on our quality of life is tremendous. Backed by this kind of investment, the St. Louis community can continue to build on its strengths and market itself as a highly desirable place to live."

Since the late 1960s, when the Garden embarked on the Master Plan that still guides its physical development, Emerson Electric has been an important partner in the Garden's success. "It has been my good fortune to work directly with the leadership of Emerson Electric through the years in achieving a number of the Garden's most important goals," remarked Peter Raven. "The company contributed $150,000 toward the construction of the John S. Lehmann Building, one of the finest facilities for systematic botany in the world; $210,000 toward the construction of the Ridgway Center, by means of which we serve more than 800,000 visitors a year; and with its latest magnificent gift of $750,000, has helped us renovate the Climatron and install an ambitious, pacesetting facility for public horticulture information, the Kemper Center for Home Gardening."

NEWS FROM THE GARDEN LIBRARY

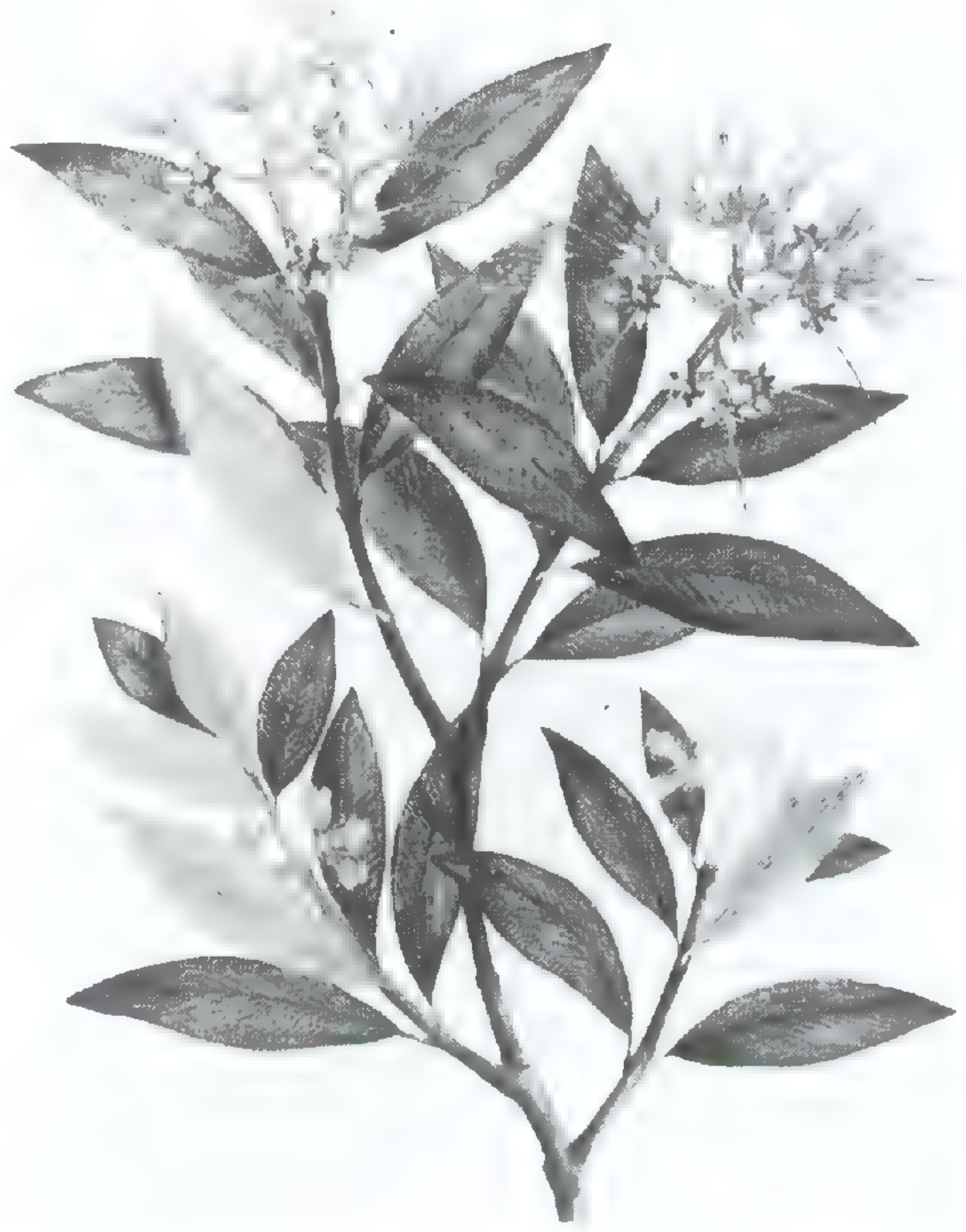
Banks' Florilegium Is Complete

The publication of *Banks' Florilegium*, consisting of 743 engravings of plants collected on Captain James Cook's first voyage, has finally been completed.

Altogether, the project took more than 25 years to complete and may represent the most ambitious, large-scale, fine-arts printing venture ever. Because they are remarkably detailed and botanically accurate, the engravings are useful in the study of plants; at the same time, their beauty makes them useful for aesthetic purposes. The Missouri Botanical Garden Library is fortunate, indeed, to have one of the 110 sets published.

The story of *Banks' Florilegium* began more than 200 years ago in 1768, when Sir Joseph Banks, a young botanist, embarked on a voyage of circumnavigation on the *Endeavour* with Captain Cook. The crew included Daniel Carl Solander, a naturalist, and Sydney Parkinson, an artist. On the trip, Banks and Solander collected some 3,607 species of plants, with more than 1,400 species entirely new to science.

Toward the end of the voyage, Sydney Parkinson died at the age of 25. He had completed 280 out of more than 900 drawings. The remaining drawings were completed later in England from Parkinson's sketches, under the supervision of Banks and Solander and with the aid of written observations and pressed specimens. Banks hired 18 master engravers to make fine-lined copperplates from the drawings, recording in impeccable detail 743 of the plants collected on the voyage.



Metrosideros excelsa, ***gathered New Zealand, October 1769–March 1770. Line engraving, plate 445 from*** **Banks' Florilegium.**

Banks' intentions to publish the plates within his lifetime were not realized. Rather, Alecto Historical Editions, in association with British Museum (Natural History), both of London, undertook the enormous task that included planning the project, cleaning and printing the plates, and publishing the plates along with a monumental *Catalogue*.

The Garden's acquisition of a complete set of *Banks' Florilegium* was made possible in part by the generosity of a number of donors. In addition to those who prefer to be anonymous, we wish to thank the Sidney S. and Sadie M. Cohen Foundation, Mr. Charles F. Cook, the Harry Edison Foundation, the Ladue Garden Club, Miss Carol L. Littmann, the John Allan Love Charitable Foundation, the Constance A. & Harry B. Mathews Jr., Foundation, the Mathews Foundation, the Morton J. May Foundation, the Metropolitan St. Louis African Violet Council, Pamela A. Pirio, the Steinberg Charitable Trust, and Mr. and Mrs. Lyle S. Woodcock. Tribute gifts to support the acquisition were given in the name of Lawrence John Pirio, James E. Brophy, Fred Dreher, and Carla Lange.

—Constance P. Wolf,
Garden Librarian

Banksia ericifolia, ***plate 741, is pulled by the printer.***

Home Gardening

Roses

Spectacular, fragrant and showy, roses are perhaps the ultimate garden flowers. Centuries of breeding have produced an astonishing array of shapes, sizes and colors to appeal to every gardener.

The genus *Rosa*, with 150 species, exists in nature from Alaska to northern Africa. Roses have been cultivated for thousands of years, probably beginning in China several hundred years before the birth of Christ. However, it wasn't until the late 18th century that cultivated roses were introduced into Europe from China. These cultivated roses were repeat or "perpetual" bloomers, making them unusual at the time and of particular interest to hybridizers. The Chinese plants were bred with native European roses to select for hardiness and a long blooming season. Most modern roses can be traced to this ancestry.

ROSE TYPES

Gardeners can choose roses from three broad types: species and shrub roses; old garden roses; and modern roses.

Species roses are those that grow naturally in the wild. These plants have a tendency to grow into large shrubs, some over eight feet high. They typically require little maintenance or pruning and are the hardiest of all roses in cold climates.

Shrub roses are produced by cross-breeding different species roses to produce hybrids specially selected for garden culture. Shrub roses sometimes are difficult to distinguish from species roses because of their close genetic relationships, and they share the same desirable characteristics.

Old garden roses include all members of a specific group of roses developed before 1867. This date marks the introduction of the first hybrid tea rose, 'La France.' Old garden roses are noted for wonderfully fragrant blooms, disease resistance and cold hardiness. These nostalgic favorites are enjoying a current resurgence in popularity.

Modern roses include all rose groups developed after 1867. Modern roses come in an extraordinary variety of shapes, colors, and growth habits. The four main groups, typically found at the local nursery, are hybrid teas, polyanthas, floribundas, and grandifloras. Other recognized garden forms include miniatures, tree roses, and climbers.

LANDSCAPING WITH ROSES

The wonderful variety in roses makes them adaptable to any garden. Low growing hybrid teas, floribundas, creepers and miniatures can be used as edging plants around a garden border or walkway. The taller shrub and species roses are well suited as background plantings and can be displayed against foundations, along fences or walls. Climbers can be trained over a fence or wire trellis to hide structural features or create enclosed spaces. Miniature roses can be potted and placed on patios or lined in rows around outdoor living spaces. They also can be grown indoors for exterior flower production.

All of this means that the roses you choose to grow should be determined in part by your garden design. Many gardeners concentrate roses in one area with a formal or symmetrical arrangement. This idea is very popular and has the advantage that all maintenance and cultural activities for roses occur in one place. On the other hand, roses can be scattered throughout the landscape alone or in combination with other plants. If you intend to raise a cutting garden, plants should be spaced far enough apart to allow you to move freely between them without compacting the root zone.

CHOOSING THE PLANTING SITE

Growing roses is really very easy. However, you will be wise to choose a site with the following characteristics: six hours or more of full sunlight, preferably morning sun; some protection from wind; well-drained soil with high content of organic matter and slightly acidic pH of 6.0 to 6.8.

It is helpful to sketch the layout of the landscape to scale before you choose your plants. Note the sizes of neighboring plants. When choosing your roses, allow for their mature size. In turn, the size of the plant will depend upon the length of the growing season, pruning, and extremes of temperature to which the plants are exposed. When in doubt, give plants plenty of room. This will improve air circulation and disease control, access for maintenance and plant competition for water and nutrients.

PLANTING

Roses can be planted at any time of year, but spring is preferred as it gives plants plenty of time to establish themselves. This is especially true for roses purchased with bare roots. Container plants can be planted successfully into summer.

After purchasing bare root plants, soak them in a bucket of water for several hours if they are to be planted immediately. This will rehydrate the roots. If you cannot plant for a day or two, do not soak them. Instead, store the plants in a cool place with some wrapping material around the roots to prevent moisture loss. They can be kept for several days this way.

When digging the planting holes, refer to your scale plan. Space floribundas and hybrid tea roses two to three feet apart; grandifloras, shrub and old roses three to five feet apart; and climbers eight to ten feet apart.

Several days before you purchase the plants, prepare the planting site by applying a four-inch layer of leaf compost, peat moss, or aged manure over the surface of the site. Dig this material into the soil, mixing thoroughly to the proper planting depth.

Generally, the larger the planting hole, the better the results. Dig the hole at least 18 to 20 inches wide and 12 to 16 inches deep with straight sides and a flat bottom. For bare rooted plants mound the soil in the bottom of the hole and spread the root system over the mound so when the hole is filled, the stem will be buried about two inches below ground level. Modern roses are grafted onto a hardy root stalk and this will protect the graft union.

Next, fill the hole with soil about half way, covering and packing to stabilize the root system. Fill the hole with a gallon or more of water and let it drain away, then finish mounding the soil so that the canes are buried to about six inches. Water well and let settle. Mulch up to the stem with chipped bark or leaf mold but do not cover the stem. It is ideal to form a water basin with the mulch to catch the water and direct it downward.

Planting container roses is much the same as bare root plants. Remove the container carefully when you are ready to plant.

CARE AND MAINTENANCE

Watering

A simple rule of thumb for watering is to do it deeply and slowly to prevent run-off. Light waterings should be avoided. Also guard against watering the foliage, as this promotes leaf and cane diseases. If this is not possible, then water in the early morning so that water on the foliage can dry quickly.

Fertilizing

Modern roses are heavy feeders and need some fertilization during the season. Ideally, a soil test should be run to determine accurately the levels of phosphate and potassium already present in the soil and establish the pH. Recommendations from these tests should be followed closely so that excess fertilizers are not applied.

The first fertilizer application should be made after the last threat of frost. Pellet fertilizers which are particularly high in phosphate can be used. Select 5-10-5, 4-8-4, or a general garden fertilizer like 10-10-10. Use about one heaping tablespoon per plant evenly distributed around the base of the plant or about three pounds of 5-10-5 per 100 square feet spread over the bed. Thereafter, make another application about every six weeks through the month of July.

Pruning

Pruning procedures vary for different types of roses. Minimize pruning for first year plants. Thereafter, when cutting flowers, remove only the length of stems you need on the blooms, leaving at least two complete leaves below the cut. For modern roses like hybrid tea, floribunda and grandiflora roses, at the end of the season prune the canes about 18 inches long so that the winds do not catch and damage the plants. In the spring when temperatures have warmed up, finish pruning by cutting the canes back into the living tissue leaving a four to six inch stub.

Old roses and shrub roses need very little maintenance pruning. These should receive a light spring pruning to shape the plant. Climbers should be pruned after flowering. Old canes should be removed at the base of the plant. This will stimulate the development of young, vigorous canes.

ALL AMERICAN ROSE SELECTION (AARS)

To ensure that new rose selections have desirable qualities, All American Rose Selection, Inc. has established 24 testing sites throughout the U.S. to evaluate new roses. The Missouri Botanical Garden is one of those sites. Each year AARS tests over 20 new selections. Information is collected over a two year period on each plant, evaluating its vigor in the local climate, disease resistance, foliage and flower quality, growth habit, bud and flower form, opening and finishing flower color, fragrance, and stem qualities. The program scores rose selections compared with other roses and standard plants in the same test plot. The scoring system reflects the consumer demand for beautiful and easy-to-grow roses. When you buy your roses, look for the AARS tag. It symbolizes excellence to rose growers everywhere.

For further information about roses, come to the Center for Home Gardening when it opens in June. We'll have displays and additional information on roses.

—Steven D. Cline, Ph.D.
Manager, Center for Home Gardening

Timely Tips from the Answer Service

Do you have a plant question? Call the Horticultural Answer Service, Monday through Saturday, 9 a.m. to noon, at ***577-5143.***

May Tips

- Fertilize azaleas after blooming. Use a formulation which has an acid reaction.
- Don't remove spring bulb foliage prematurely or next year's flower production will decline. Bulbs can be moved or divided as the foliage dies.
- Trees with a history of borer problems should receive their first spray now. Repeat twice at three week intervals.
- Pinch back mums.
- Slugs will hide during the daytime beneath a board placed over damp ground. Check each morning and destroy any slugs that have gathered.
- Growing lettuce under screening materials will slow bolting and extend harvest into hot weather.
- Place cutworm collars around young transplants. Collars are easily made from cardboard strips.
- Control caterpillars on broccoli and cabbage plants by handpicking or biological sprays such as B.T.
- Don't spray any fruits while in bloom. Refer to local Extension publications for fruit spray schedules.
- Keep bluegrass cut at 1.5 to 2.5 inch height, mow tall fescues at 2 to 3.5 inch height, and mow zoysia lawns to 1.5 inch height. Cut grass in shaded areas to higher recommendations. Remove no more than one-half inch at each mowing. Leave clippings on the lawn to reduce yard waste and gain fertilization benefits.
- Birds eat many insect pests. Attract them by providing good nesting habitats.
- Watch for fireflies on warm nights. Both adults and larvae are important beneficial predators, so avoid over-collecting them.
- Herb plants in average soils need no extra fertilizer. Too much may reduce flavor and pungency at harvest.

June Tips

- Apply organic mulches as the soil warms. These will conserve moisture, discourage weeds, and enrich the soil as they decay.
- When night temperatures stay about 50°F, bring houseplants outdoors for the summer.
- Early detection is essential for good control of vegetable pests. Learn to identify and distinguish between pests and beneficial predators.
- To minimize diseases, water with overhead irrigation early enough in the day to allow foliage to dry before nightfall.
- Thinning overloaded fruit trees will result in larger and healthier fruits at harvest time. Thinned fruits should be a hands-width apart. Prune and train young fruit trees to eliminate poorly positioned branches and to establish proper crotch angles.
- Renovate strawberries after harvest. Mow the rows; thin out excess plants; remove weeds; fertilize and apply a mulch for weed control.
- Spray trunks of peach trees and other stone fruits for peach tree borers.

—Chip Tynan, The Answer Service

Center for Plant Conservation

TIM RYAN

Left to right: Don Falk, Michael O'Neal, Peggy Olwell, Greg Wieland.

Staff Organized in St. Louis

Don Falk, the director and co-founder of the nationwide Center for Plant Conservation, is enthusiastic about the move of the Center's headquarters from Boston to the Missouri Botanical Garden last February. "Being associated with one of the outstanding scientific institutions in the world will add immensely to CPC's stature," he says.

Falk, who has a Master's degree in environmental policy from Tufts University, was challenged as a graduate student to seek alternative strategies for preserving species. While working as Energy Director of the city of Cambridge, Massachusetts, a post he held from 1980 to 1984, he was motivated to begin putting the initial funding together for the Center for Plant Conservation. As Energy Director, he saw a strong link between society's excessive consumption of natural resources and its impact on the environment.

Working with Peter Ashton, then-director of the Arnold Arboretum, and Jonathan Shaw, director of the New England Wildflower Society, and a partner, Frank Thibodeau, Falk put together the concept and strategy for the Center. Late in 1982, he called a very enthusiastic Peter Raven. The Missouri Botanical Garden became one of CPC's first affiliated botanical gardens.

The Center for Plant Conservation opened its doors on April 4, 1984, with key start-up grants from the Andrew W. Mellon Foundation and several Boston-area individuals and families; subsequent grants came from the William and Flora Hewlett, George Gund, David and Lucille Packard, W. Alton Jones, and John D. and Catherine T. MacArthur Foundations, the Pew Charitable Trusts, and the National Science Foundation.

The Center is the only organization focused exclusively on plant conservation. In its seven years of existence, the Center has pioneered the development of integrated conservation strategies for plants. This approach weaves together land acquisition and management, ecological restoration, legal protection, conservation collections, and reintroduction of species. The Center not only supports efforts to protect plant habitats, it plays its own key role to protect the plants themselves by harboring and nurturing them in botanical gardens around the nation, and eventually reintroducing them into the wild.

Besides Falk, two other CPC staff members moved to St. Louis from Boston. Peggy Olwell, director of conservation programs, manages and administers the Center's national network of 21 botanical gardens and arboreta that houses the Center's National Collection of Endangered Plants. Olwell also coordinates the Center's integrated conservation program. She worked for the U.S. Fish and Wildlife Service's Office of Endangered Species in Albuquerque, N.M. for six years before joining CPC.

Michael O'Neal, information system manager, joined CPC in 1989 after four years at the Chicago Botanic Garden. He is responsible for the design, installation, and support of the Center's computer network database programs.

After a national search, CPC found its National Collection Coordinator right in its own back yard. Greg Wieland moved to CPC from the Garden's horticulture division, where as Plant Recorder he managed the Garden's horticultural database, including records on the plants maintained by the Garden for CPC. As National Collection Coordinator, Greg works with the 20 botanical gardens and arboreta tracking the national collection of about 400 taxa.

For Falk, CPC has moved closer to his ultimate goal of ensuring survival of endangered plants in the wild. "With the move to the Garden, we now think that we are in a position to get a step ahead of the endangerment problem," says Falk. "It is within our grasp to prevent further extinction of plant diversity in the U.S. and eventually worldwide."

New May Scholars

The Garden has awarded May Scholarships to three outstanding young Latin American scientists, Dr. Hilda Maria Longhi-Wagner and Dr. Tarciso Filgueiras from Brazil, and Dr. Nelson Ramírez from Venezuela. They are expected in St. Louis in July and will be guests of the Garden for several months. The May Scholarships are supported by a generous grant from the May Department Stores Company and its Famous-Barr Division to enable scientists from rain forest countries to study at the Garden.

Dr. Longhi-Wagner is a Professor of Botany at the Federal University of Rio Grande do Sul in Porto Alegre. She has a Master's degree from the same university, and in 1986 received her Ph.D. degree from the University of São Paulo.

Dr. Filgueiras is a researcher with the Division of Environmental Studies of the Brazilian Institute of Geography and Statistics (IBGE) in Brasilia. He holds a Master's degree from Oregon State University and was awarded his Ph.D. degree by the University of Campinas, Brazil, in 1986.

Both Brazilian May Scholars are specialists in the grass family (Gramineae), a very important family of vascular plants and the source of many useful products. They will be collaborating with Dr. Gerrit Davidse of the Garden's scientific staff. Dr. Longhi-Wagner will be studying grasses native to Brazil and Paraguay and preparing taxonomic treatments for the Flora of Paraguay. Dr. Filgueiras will be completing a checklist of the grasses of central Brazil using the herbarium, library and computer facilities at the Garden. Dr. Filgueiras is a member of the Steering Committee of an international project to study the grasses of the new world, and both he and Dr. Longhi-Wagner will attend meetings concerning this project in San Antonio, Texas, and in St. Louis.

Dr. Ramírez is an Associate Professor of Botany at the Universidad Central in Caracas. He received his degree from the Universidad Central in 1990. Dr. Ramírez is a specialist in another economically important plant family, the Leguminosae or bean family. While in St. Louis he will be collaborating with Dr. Paul Berry of our staff on several projects having to do with tropical legumes, particularly in the field of reproductive biology.

Plants Show Promise for New Medicines

By James S. Miller, Ph.D.,
MBG Research Staff

WHY is the World Health Organization (WHO) so interested in sweet wormwood, *Artemesia anna*, and the National Cancer Institute (NCI) in the Pacific yew, *Taxus brevifolia*? The answer is that these two plants contain natural compounds that show promise as new medicines.

Sweet wormwood produces the chemical compound artemesin, which may be effective in treating malaria, and the Pacific yew yields taxol, which is effective against the ovarian cancer that claims 12,000 lives a year. More than 25 percent of the medicines currently used in the United States come from plants, and even more of our synthetic drugs were developed from the study of natural products. The best known is aspirin, which has its origins in the bark of willows.

Malaria today is primarily a disease of tropical regions, where it afflicts 200-400 million people each year, a scale difficult for those of us in industrialized countries to comprehend. Two million of these people die every year; malaria is responsible for 25 percent of the deaths of African children aged 1-4. Currently, the most widely used antimalarial drug is Chloroquine, a synthetic drug that is chemically similar to quinine.

Quinine comes from the bark of the South American cinchona tree, and was the first effective medicine for malaria. It is still the most effective medicine, but causes serious side effects, including liver and hearing damage. Chloroquine is a safer synthetic compound that is modeled on the original natural product. Natural products research gives us detailed knowledge about how drugs actually work. Researchers use that information to guide the development of synthetic drugs. Without the discovery of quinine, medical researchers would never have discovered Chloroquine.

However, some strains of malaria parasites have developed resistance to Chloroquine, so this drug is no longer effective in all situations. The WHO is currently taking a great interest in artemesin because the compound works in an entirely different manner from quinine and Chloroquine and thus may be effective against Chloroquine-resistant malaria. The chemical structure of artemisia could never have been predicted from the study of quinine.

Natural products chemistry has produced a large proportion of our pharmaceuticals, most of them derived from higher plants and fungi. Some drugs come directly from the plants and are large, complex molecules that cannot be synthesized. An example is reserpine, a compound used in high blood pressure medicines. It is derived from a species of *Rauwolfia* from southeast Asia.

> As the tropical forests disappear, so do thousands of species of plants that could provide new medicines for generations to come.

The alkaloids vincristine and vinblastine, derived from *Catharanthus roseum*, the rosy periwinkle of Madagascar, are used to treat childhood leukemia and Hodgkin's disease. The Garden maintains an active program of conservation and research in Madagascar, where three-quarters of the island's natural vegetation has already been destroyed.

Other drugs, including many of our most important medications, are "second generation" synthetic compounds that have chemical structures similar to naturally occurring substances. As in the case of quinine and Chloroquine, when a natural substance shows effectiveness against disease, researchers may be able to modify its structure or synthesize molecules with similar structure and activity.

Research botanists at the Missouri Botanical Garden are actively involved in several drug discovery programs with the National Cancer Institute and the Monsanto Corporation. According to Monsanto's Bioproducts Chemistry Manager, Stephen Brewer, the twenty top-selling medicines in the United States net six billion dollars in sales annually and all owe their existence in some way to natural products research. Of these, two are derived directly from natural sources, three are semi-synthetic, and eight are synthetic drugs which have replaced the original natural chemical because of superior performance. The remaining seven best-sellers were not discovered directly as natural products, but did have their mechanism of action defined by natural products research. The antihistamines are examples of this: without understanding histamines, a natural substance originally isolated from ergot, a fungus that grows on wheat, researchers would not have discovered the two classes of antihistamines used to treat motion sickness and gastric ulcers.

Botanists from the Garden are currently collecting 1,500 sample a year of African plants from Gabon, Tanzania, and Madagascar for the National Cancer Institute's drug discovery program. Far greater numbers of both plant and soil samples are collected for their content of fungi and bacteria in the Garden's program with Monsanto. Yet despite these efforts, only one to two percent of the world's 250,000 higher plants have been thoroughly studied for useful pharmaceuticals. At the same time, more than 150 square miles of tropical rain forest disappear each day, an area larger than Rhode Island every week.

The tropical rain forests contain the earth's greatest diversity of life, with more than half of the world's plant and animal species living in less than ten percent of the world's land area. Many of these species remain unknown to scientists, still waiting to be discovered. Yet the handful of tropical plants studied so far have yielded medicines for the treatment of high blood pressure, glaucoma, childhood leukemia, Hodgkin's disease, and malaria. It was a tropical vine, *Chondrodendron*, used by South American Indians as an arrow poison, that provided the compound that originally allowed anestheologists to paralyze the human diaphragm, and thus made open heart surgery possible.

As these tropical forests disappear, so do the thousands of unstudied species of plants that could provide new medicines for generations to come. Each species of plant, containing hundreds of complex chemical compounds, can be thought of as a volume in a library. The effect of their extinction on medical research is analogous to the burning of unopened, unread volumes from the world's medical library—an incalculable loss. ■

WALKING TOURS
Every Tuesday, Saturday and Sunday 1:00 p.m.

Join the Garden Guides for a tour of the grounds, featuring the art, architecture, history and horticulture of the Garden. Meet at the ticket counter in the Ridgway Center. Free with regular Garden admission.

Missouri Botanical Garden
CALENDAR OF EVENTS
May-June 1991

MAY 25-30/Everything's Coming Up Roses

A week of events celebrating America's favorite flower.

25-26 SATURDAY & SUNDAY

Rose Society Show

Noon to 5 p.m. Saturday; 9 a.m. to 5 p.m. Sunday, Ridgway Center. A magnificent display by the Greater St. Louis Rose Society. Free with Garden admission.

25-30 SATURDAY - THURSDAY

"Roses" Film Festival

1 p.m. and 7 p.m., Shoenberg Auditorium. Free with Garden admission. Limited seating.

Sat. May 25 - *Broadway Danny Rose*
Sun. May 26 - *Rosemarie*
Tues. May 28 - *The Rose Tattoo*
Wed. May 29 - *The Subject Was Roses*
Thurs. May 30 - *The Purple Rose of Cairo*

27 MONDAY

A Rose Is a Rose Is a Rose

9 am. to 8 p.m. All ladies with the first name "Rose" will receive free admission to the Garden.

28 TUESDAY

Designer Roses

10 a.m. to 3 p.m., Ridgway Center. A display of flower arrangements by local floral designers. At 11 a.m., Pat Scace, assistant exhibit designer at MBG, will provide ideas on using roses in floral arrangements for special occasions. Free with Garden admission.

29 WEDNESDAY

"How Does Your Garden Grow?"

10 a.m. to 2 p.m., Gladney and Lehmann Rose Gardens. Master Gardeners will be on hand to answer your questions and provide gardening tips. The MBG horticulture staff will be at work in both gardens. Free with Garden admission.

30 THURSDAY

"Ring Around the Rosey"

10 a.m. to 3 p.m., Ridgway Center. A fun-filled day for kids, with storytelling, craft workshops, games and surprises. Workshops require a fee and reservations: call 577-5125 beginning Monday, May 13.

MAY 31/Rose Evening

5:30 to 8:30 p.m., grounds. Don't miss this very special Members' evening, featuring our beautiful rose gardens. Garden Horticulture staff will answer questions on rose care. Other delights include music, a free rose care brochure, film on the growing and care of roses, and an optional buffet supper. Special attendance gift. Watch your mail for more information. For members only.

MAY 17/MEMBERS' DAY
Celebrate the 10th Anniversary of Purple Martin Evening

6:30 p.m., Shoenberg Auditorium and grounds. It's a traditio
Welcome these popular birds back with a lecture, film, and s
show in the Auditorium, followed by a stroll through the Gar
Purple Martin neighborhood. Led for the 10th year by W. As
Gray III. There will be a drawing for a Purple Martin house.
anniversary cake. Cash bar; no reservations required. Free.
Limited seating.

MAY 27 Memorial Day / Summer Hours Beg

9 a.m. to 8 p.m. through Labor Day, September 2. Enjoy extended evening hours and visit the Garden for a tranquil twilight stroll.

MAY

4 SATURDAY

Day of Asian Dances and Costumes

1:30 and 3:30 p.m., Shoenberg Auditorium. In celebration of National Asian Pacific American Heritage Month, the Coalition of Asian Americans presents a program of Thai classical dance, Taiwanese and Filipino folk dance, and fashions from China, Thailand, Taiwan and the Philippines. The day's events are sponsored by Anheuser-Busch Companies, St. Louis Center for International Relations and the Garden. Call 454-1744 for more information.

4-5 SATURDA & SUNDA

African Violet Show

Noon to 5 p.m. Saturday, 9 a
p.m. Sunday, Orthwein Flora
37th annual juried show, disp
sale sponsored by the Metro
St. Louis African Violet Cour
From micro-minis through la
standards in white, pink, red,
and purple. Come enjoy and
about these popular flowers.
with Garden admission.

continued on n

/ *continued*

MONDAY

Clinic

. to noon, Ridgway Center.
expert advice and trouble-
ng for your plant problems, by
er Gardeners. Samples of sick
are welcome. Free.

SUNDAY

er St. Louis
ociety Show

to 5 p.m., Orthwein Floral
A juried show and display of
cular blooms in all shapes and
. Free with Garden
sion.

TUESDAY

k and Travels of a
ical Sculptor"

.m., Shoenberg Auditorium.
re by Patrick O'Hara, noted
culptor of ceramic flowers.
'Hara will discuss the many
aces and flowers he has stud-
America, Europe, Asia and
, and the resulting sculptures.

18-19 SATURDAY & SUNDAY

Horticulture Society Show

Noon to 5 p.m. Saturday; 9 a.m. to 5 p.m. Sunday, Orthwein Floral Hall. Vegetables, wildflowers, cut flowers and more are judged and displayed. Free with Garden admission.

20 MONDAY

Plant Clinic

9 a.m. to noon, Ridgway Center. See May 6 for details.

25 SATURDAY

Robert Stolz Exhibit

9 a.m. to 5 p.m., Monsanto Hall; through June 23. Paintings by St. Louisan Robert Stolz feature botanical studies and landscapes of western Colorado. Free with Garden admission.

25-27 SATURDAY-MONDAY

Dahlia Society Plant Sale

9 a.m. to 4 p.m. daily, Ridgway Center. Dazzling color, consistent blooms and healthy foliage will grow from the varieties offered by the Greater St. Louis Dahlia Society. Free admission to the sale.

JUNE 8 & 9/Kemper Center for Home Gardening

June 8: *Members' Preview Day 9 a.m. to 5 p.m.*
June 9: *Public opening noon to 5 p.m., ceremony at noon*

Come celebrate with a special preview just for Members all day on Saturday, and the ribbon cutting ceremony on Sunday. Festivities will include tours of the Center, a lecture and book signing by John Wilson of PBS' "Victory Garden," cooking demonstrations, and more! Kids will love the Purina Mills, Inc. petting farm. Adults will enjoy the display of live birds and a wild bird product booth including a free analysis of St. Louis area birds and how and what to feed them. There also will be drawings for gardening equipment and supplies.

JUNE 28/MEMBERS' DAY
Members' Musical Evening

5:30 to 9:00 p.m., Spoehrer Plaza; concert begins at 7:30 p.m. Listen to the sounds of the Gateway City Big Band, a Garden favorite. Bring a picnic supper if desired, and lawn chairs and blankets for seating. Cash bar available. Free, for Members only.

JUNE

MONDAY

Clinic

to noon, Ridgway Center.
May 6 for details.

WEDNESDAY

n June

o 9:00 p.m., Cohen
itheater. The popular summer
rt series returns with four
esday evening performances
ng nationally known jazz art-
onight: Saxophonist Butch
as. Lawn seating; blankets or
hairs are encouraged and pic-
ppers are welcome. Cash bar;
oholic beverages may be
nt onto Garden grounds. Free
mbers; $2 non-members.
s go on sale Monday, May 20
Ridgway Center ticket
er.

8 SATURDAY

Greater St. Louis Iris Society Show

See May 12 for details.

12 WEDNESDAY

Jazz in June

7:30 to 9:30 p.m., Cohen Amphitheater. Ronnie Burrage Ensemble from New York. See June 5 for details.

15-16 SATURDAY & SUNDAY

Lily Society Flower Show

Noon to 8 p.m., Saturday; 9 a.m. to 8 p.m., Sunday, Ridgway Center. Mid-America Regional Lily Society (MARLS) presents a display of beautiful blooms. Free with Garden admission.

17 MONDAY

Plant Clinic

9 am. to noon, Ridgway Center. See May 6 for details.

19 WEDNESDAY

Jazz in June

7:30 to 9:30 p.m., Cohen Amphitheater. Tayammum Falah Quartet featuring Kansas City saxophonist Ahmad Alaadeen. See June 5 for details.

23 SUNDAY

West County Daylily Society Show

Noon to 8 p.m., Ridgway Center. Come enjoy a lovely display of these summertime favorites. Free with Garden admission.

26 WEDNESDAY

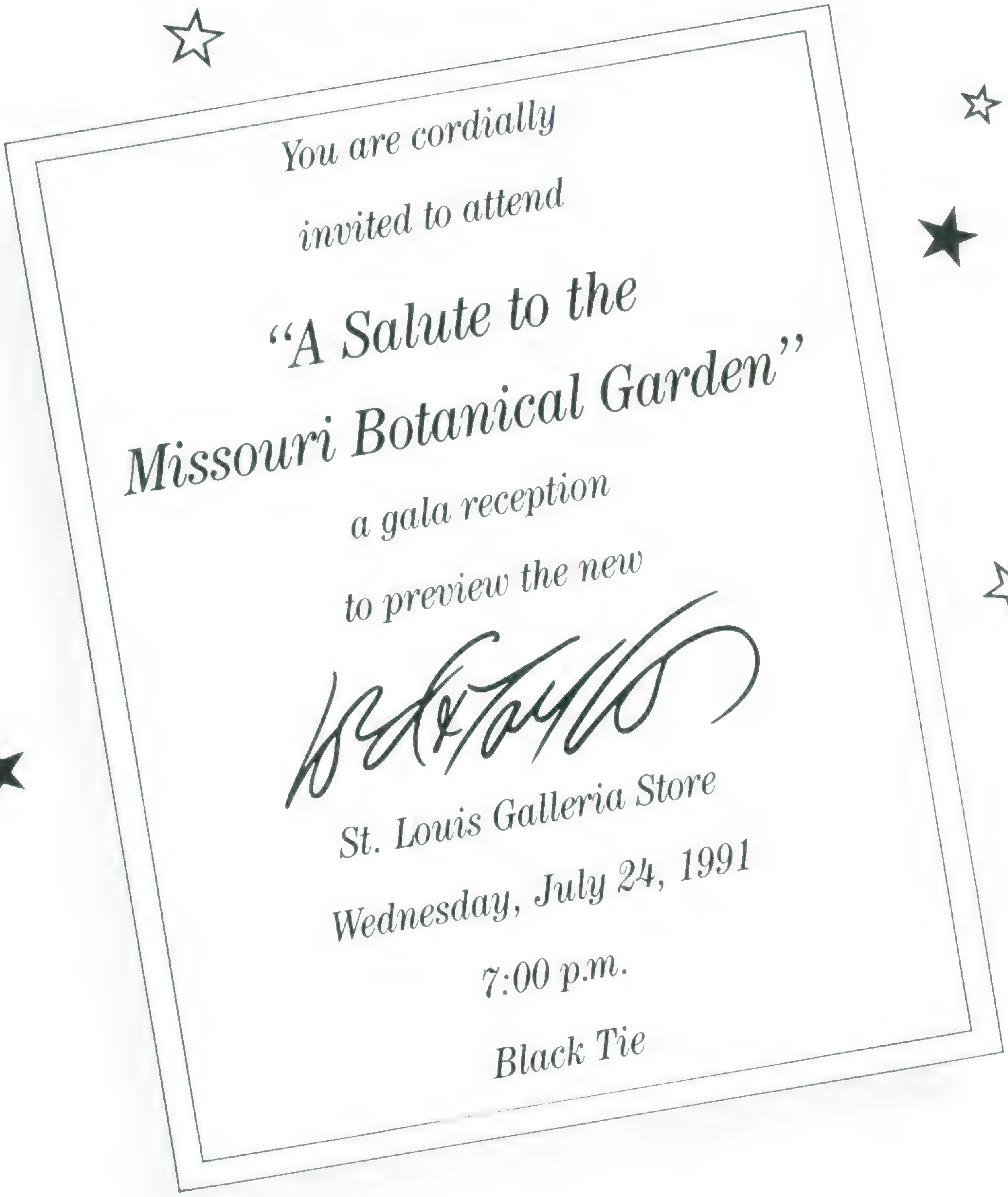
Jazz in June

7:30 to 9:30 p.m., Cohen Amphitheater. Malachi Thompson Quartet from Chicago. See June 5 for details.

GARDEN WALKERS BREAKFAST
Every Wednesday and Saturday, 7 to 10:30 a.m.

The Garden opens early on Wednesday and Saturday mornings. The mileage of various paths around the grounds are available at the ticket counter. Health and nutrition programs will be offered the last Saturday of each month in cooperation with the American Heart Association; call 577-5125 for information. The Gardenview Restaurant offers its "heart healthy" breakfast buffet of cereals, fruit, juice, and yogurt. The greenhouses do not open until regular opening hours at 9:00 a.m. Admission is free before noon every Wednesday and Saturday.

From the Membership Office



You are cordially
invited to attend

"A Salute to the
Missouri Botanical Garden"

a gala reception
to preview the new

Lord & Taylor

St. Louis Galleria Store
Wednesday, July 24, 1991
7:00 p.m.
Black Tie

Reservation Form—"A Salute to the Missouri Botanical Garden"

Tickets are $100 per person. Payment may be made by VISA, MasterCard by calling 577-9500, or by check. Make check payable to: Missouri Botanical Garden.

RESERVATIONS ARE LIMITED. A confirmation will be mailed in June.

Name(s)____________________

Address____________________

City__________ State__________ Zip__________

Number of tickets $100 each____________________

Total payment____________________

I cannot attend, but will make a contribution of:____________________

$75 of each $100 ticket is tax deductible.
Additional information: Brenda Banjak, Membership Coordinator, 577-9517

Mail to: "Salute to the Garden, Missouri Botanical Garden,
P.O. Box 299, St. Louis, MO 63166-0299.

Dillard's and the Garden "Focus on Mom"

''Focus on Mom'' is the theme of the Garden's luncheon in honor of Mother's Day, sponsored by Dillard's. Held on Friday, May 10, 1991, this ''Pre-Mother's Day'' luncheon will feature attendance drawings, spring and summer fashions by Dillard's and a festive luncheon served under the outdoor party tent at the Ridgway Center.

Reservations are $35 per person for members and $45 per person for nonmembers. Reservation deadline is May 7. See the invitation mailed recently to all members, or call 577-9500.

Make Your "Bed and Breakfast" Reservations Today!

Members have just until May 10 to make reservations for the 1991 ''Bed and Breakfast'' event at the Garden. For a $35 donation you can help sponsor one year's care of a plant bed containing one of four endangered American plant species grown at the Garden as part of the national Center for Plant Conservation network. To thank you for your help, you will receive:

- A complimentary buffet breakfast for you and one guest on either of two dates: Wednesday, May 15 or Saturday, June 1 and
- An attractive personalized certificate declaring your support for Running buffalo clover, Lucy Braun's eupatorium, Decurrent false aster, or Missouri bladderpod.

See the letter mailed in March to all members or call 577-5118 to make your reservation today!

TOWER GROVE HOUSE

Auxiliary Seeks New Members

Interested persons are invited to join the Tower Grove House Auxiliary. The Auxiliary is active in a number of activities to benefit Tower Grove House throughout the year: members operate the Tea Room, organize the Christmas Candlelight Tour, and sponsor a celebration of Henry Shaw's birthday in July. For more information please call 577-5150.

New Guides Are Needed

Tower Grove House is searching for volunteer tour guides to escort visitors through Henry Shaw's country home. The House is a beautifully restored Victorian mansion that attracts visitors from around the world. Guides need to have a love of history and the ability to present the furnishings and cultural details of the House and Victorian society. Call 577-5187 for more information.

THIS SPRING AT SHAW ARBORETUM

Burning Restores Woodland Habitats

Visitors to the Arboretum during the spring of 1991 may have noticed, with surprise, the two burned areas in the woods near the Trail House. These controlled woodland burns were carried out by Arboretum staff in early March. The total area burned was about 20 acres.

Most people accept the idea of burning as routine in prairie management, but the woodland burns aroused considerable interest because of their unfamiliarity. While a woodland wildfire can be very destructive, controlled, cool-season burns are now regularly used by the Missouri Department of Natural Resources, the Missouri Conservation Department, and The Nature Conservancy for woodland habitat management throughout the state.

Before European settlers came, all of Missouri's vegetation was subject to periodic fires. Cool, moist valleys burned infrequently, while slopes and uplands burned every 1-15 years. After the acquisition of the Louisiana Purchase, U.S. government surveyors described virtually every square mile of what is now Missouri, including accounts of the vegetation. According to surveyor reports, the dense upland thickets and woodlands found today were a relative rarity at that time.

About 30 percent of the state was prairie, and another 30 percent was an open woodland-grassland mix called savanna, barrens or park land. These areas were dominated by broad-crowned trees and clumps of brush, which became established during wet spells when no fires passed through for several years. Between the trees a complex of grasses and wildflowers existed that closely resembled that of the treeless prairies, but also had a small number of unique species. Many animal species, including the fox squirrel, eastern bluebird, most flycatchers and the great spangled fritillary (a butterfly) were savanna species.

Studies in progress by The Nature Conservancy and Arboretum staff reveal that much of what is now upland woods at the Arboretum was originally savanna, and that glades were more extensive in the past. Selective clearing, especially of eastern red cedars, and periodic burning of our savannas-turned-woods and cedar-choked glades are the preferred strategies for bringing back these endangered natural plant communities.

The results of the first two burns are of interest. The burns were conducted after the surface leaf litter dried out, but while the material beneath the leaf litter was still cool and moist. The moist humus and even some small green plants remained unscathed after passage of the fire. The staff noticed many crows, robins, bobwhite and other birds feeding in the burn areas the following day, taking advantage of the relatively easy bug-hunting afforded by the removal of leaf cover. Above ground, many small saplings and some larger specimens of fire-sensitive trees such as cedars and sugar maples were killed. Only a small fraction of the larger oaks and hickories were even singed by the fire and these species are known to survive significant fire scarring.

Burning of surface litter releases mineral nutrients into the soil. Where saplings and cedars are killed, increased sunlight and earlier warming of the ground are expected to encourage sun-loving wildflowers and native grasses. The careful observer may see butterflies and other small animals lapping up the mineral-rich ash after a rain. The staff observed numerous earthworm castings after burning in one area; apparently the worms were at the surface getting their mineral supplements.

The burning is carefully controlled, and the program will proceed gradually as the results are monitored. The beneficial trends of increasing biological activity and diversity are expected to continue as further burning and clearing restore the florid beauty of the savanna and glade communities at the Arboretum.

—James C. Trager,
Arboretum Naturalist

RICHARD BENKOF

◀ *Katherine Chambers (left) and Hazel Loewenwarter at the Orchid Show.*

Volunteer Profiles

Katherine Chambers and Hazel Loewenwarter

Katherine Marie Pfeifer Chambers and Hazel Schulein Loewenwarter have been Garden Guides together for 13 years, but they have been best friends for 75 years, "since 1916, the first day at Central High School," Katherine says.

"We were undergraduates at Washington University together, too," Hazel continues. "We graduated in 1923. I went on to earn a master's degree in French at the University of Wisconsin in 1925, then lived in New York for 48 years before I moved back to St. Louis. Katherine and I had always remained friends, and in 1978 I persuaded her to volunteer with me at the Garden." Hazel had been a Garden Guide since 1976. She also serves on the Board of the Miriam School.

In addition to her work as a Guide, Katherine has been a volunteer instructor at the Garden since the program's inception in 1982. She earned a M.S. in zoology and a Ph.D. in education from Washington University and was a teacher of science at Soldan High School for 25 years. She went on to serve the St. Louis Public Schools as a supervisor of programs for gifted students in science and mathematics and was a professor at Harris Teacher's College for ten years before retiring in 1971. In retirement she has been just as active, serving the Science Center, Washington University, the International Institute, the St. Louis Nature Study Society, the Audubon Society, the Missouri Native Plants Society, the Webster Groves Nature Study Society, and the Archdiocese of St. Louis.

Katherine brings her extraordinary achievements as a teacher of science to her work as a volunteer instructor at the Garden. She has taught 30 different classes, and last summer she served on a team of instructors who designed a course on the tropical rain forest including a narrated slide show. "I always give my students an assignment to be completed by the end of class," Katherine explains. "I have found that is one of the best ways to focus their attention and help them to remember what they see here."

Hazel and Katherine have seen a number of changes at the Garden in the past 15 years. "When I began as a Guide, there was no Japanese Garden, no Ridgway Center," Hazel said. "The number of Guides has increased too, which has helped us to reduce the size of our tour groups. That's a great improvement, because sometimes it's hard for everyone to hear, especially in the Climatron, with all the waterfalls going!"

"It's easier for the children to see what we're looking at, too," Katherine explained. "Most of the school children are in second or third grade, so they're pretty lively! We carry bags of props to 'show and tell;' they really understand a cork tree, for instance, if you can hold up a piece of cork and let them touch it."

The two friends enjoy taking "busman's honeymoons" together as well, vacationing in out of the way places such as India and the Galapagos. "We're going to Alaska in May," Hazel said. "We like to go where we can study the natural beauty and wildlife."

These two lifelong friends have enriched the lives of countless children and adults who visit and work at the Garden. Their indefatigable efforts and generous gifts of their time and talent are deeply appreciated.

New Volunteer Guides and Instructors

This past winter two groups of dedicated volunteers entered intensive training programs to become Garden Guides or Volunteer Instructors. The 19 new Guides and four new instructors completed their courses April 9 (pictured at right).

The Garden's education programs serve thousands of school children each year, thanks to the help of volunteers. In 1990, 62 active Guides and 20 instructors provided tours and classes for 30,434 of these students.

The Garden Guides was founded in 1968 to give tours of the grounds. The Guides have always stressed the educational aspect of these tours. They receive an intensive ten-week training course in botany and natural sciences along with history of the Garden, its architecture and sculpture. Extra attention is paid to interpreting special displays, such as the Climatron, Desert House, and Japanese Garden, to emphasize their special significance. The Guides keep their knowledge current with regular seminars. They are among the most dedicated and knowledgeable volunteers at the Garden.

The Volunteer Instructors program was established in 1982 to help meet the demand for school visits to the Garden. The instructors teach classes of all ages with supervision by Garden staff. Their eight-week training course examines science topics in depth and includes hands-on workshops, lectures and tours. After a period of team teaching, the volunteers handle classes on their own.

"We rely on these volunteers' enthusiasm, creativity, and skill to enhance each child's visit," said Sandra Rode, manager of educational services at the Garden. "With their help we offer not only a field trip to a beautiful place, but a new way of looking at science and the natural world. We are delighted to have them all."

▲

New Garden Guides, front left to right: Sue Allan, Robert Smith, Irene Francisco, Susan Hall, Susan Fry, David Barnum, Fran Pollvogt, Marlene Poger, Barbara O'Halloran, Pat Winkelmann, Barbara Huning, Elsie Marziotti, Kathy Lupo (training program leader), John Viviano, Ann Viviano. Back row, left to right: Mary Jane Kirtz (training program leader), Jackie Johnson, Kanza Easterly, Sandra Rode (MBG education staff), Jane Goode, Judy Horan. Not pictured: Jacqueline Mitchell.

◀

New volunteer instructors, left to right: Mary Doerr, Roberta Hoffman, Monica Clapper, Janet Ludewig.

Neighborhood Garden Named in Memory of Paul Kohl

On May 20, 1991 the Garden will dedicate a new neighborhood garden in memory of Paul A. Kohl, a long-time horticulturist at the Garden who died in 1985. The Paul Kohl Memorial Garden will be located on a lot at the corner of Shaw Boulevard and Tower Grove Avenue, opposite the Garden.

The garden's simple and elegant landscape is designed to enhance the neighborhood as a tranquil place for sitting and strolling. The green carpet of grass is accented by two berms, one through the center and one along the west and north sides. The plantings will consist of red oak *(Quercus rubra)*, kousa dogwood *(Cornus kousa)*, arrowwood viburnum *(Viburnum dentatum)*, and fragrant sumac *(Rhus aromatica* 'Gro-Low'). These plants have been chosen for their diverse types of flowers, interesting summer and fall foliage, and growth forms for winter appeal.

Paul Kohl graduated from the Henry Shaw School of Gardening in 1917 and began working for the Missouri Botanical Garden in 1920. His association with the Garden continued for 65 years. He began as a floriculturist and is best known for growing the plants and designing and staging the lovely floral displays that appear at the Garden four times a year.

In 1982 Kohl was honored with the Henry Shaw Medal, which recognizes those who have made a significant contribution to the Garden, botanical research, horticulture, conservation, or the museum community.

The Garden acquired the property in 1982 with an eye toward the future. "We think this pocket garden will be a nice amenity for the neighborhood," said Marshall R. Crosby, assistant director of the Garden. "It will also be a nice introduction to the Garden for visitors coming in from Shaw Boulevard and Tower Grove Avenue."

CLIFF WILLIS

Pictured with Dr. Peter H. Raven, the Garden's director (center), are Larry Schmidt (left), head of Ranken's Auto/Body Department, and Alan Davenport, assistant head of the Automotive Department.

Utility Vehicle Gets A Face Lift

One of the Garden's Cushman utility vehicles recently received a complete overhaul by the staff and students at Ranken Technical College of St. Louis. The cart was rebuilt, repaired and repainted as an educational training project, with the work donated to the Garden.

Ranken is an 83-year-old, private, non-profit institution offering Associate of Technology degrees in nine programs and certificates in three others. W. Ashley Gray III, vice president of development for the College, says, "This project provided good, real life, practical experience for our students. We are delighted to provide a service to the Garden."

RICHARD BENKOF

Partnership Program Studies Energy Efficiency

On February 14, students from St. Louis city and county high schools came to the Garden for seminars in energy use. Small groups conducted "Energy Building Audits" on three different buildings at the Garden to survey which structures were most energy efficient. Students were encouraged to examine their own homes, schools and personal habits to increase awareness of efficient energy use and conservation of natural resources.

At left: Students examine the Desert House with guide Maurita Stueck.

HENRY SHAW ACADEMY

Dances With Wolves

"I strained my ears and was rewarded with a faint, ghostly howl that grew louder and seemed to split into many barks and yips . . . It is really hard to explain the feeling that this caused. I couldn't help but smile. I was mentally as well as physically tingling. I felt almost like the wolves had given us a gift by sharing this emotional experience."

These were the reactions of students in the 1991 Henry Shaw Academy Explorers Field Study Program who traveled to Alligator River Wildlife Refuge in North Carolina to observe and study the reintroduction of red wolves into a large wild habitat.

This exceptional program was the result of a year of planning by Jeff DePew, coordinator of the Henry Shaw Academy, and Gary Schoenberger of the Wild Canid Survival and Research Center (WCSRC) in Eureka, Missouri. It involved the collaboration of Washington University, the Missouri Botanical Garden, WCSRC, and the staff at Alligator River Wildlife Refuge. The project was funded, in part, by a scholarship fund from the St. Louis Community Foundation.

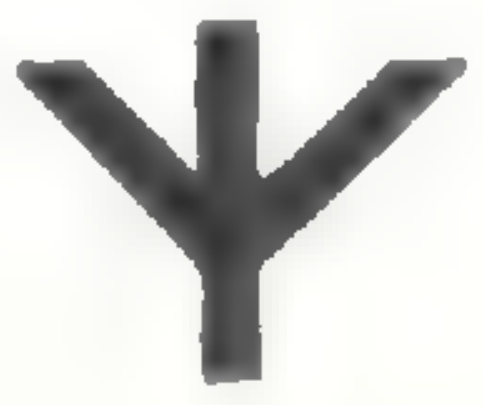
The seven students and their instructors DePew and Schoenberger spent two days working with the U.S. Fish and Wildlife service. Students participated in radio tracking, track and scat analysis, an aerial survey of plant and animal habitats of the refuge, and many discussions of the importance and mechanics of endangered species reintroduction and restoration projects.

Continuing their studies closer to home, the students spent a day at the WCSRC in Eureka. They studied wolf behavior, reintroduction programs, and the basic genetic identification research that Washington University pioneered with "true" red wolf *(Canis rufus)* species.

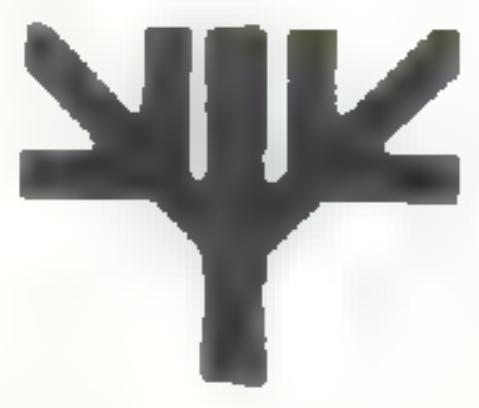
Washington University researchers used their genetic studies to determine a pure strain of red wolf from coyote and dog crossed animals. The red wolves that were authenticated have been reintroduced into the wildlife refuge in Alligator River. The relevance and significance of reintroducing endangered or "extinct" species into wild areas has long term benefits for the biodiversity and strength of ecosystems.

The MBG Symbol

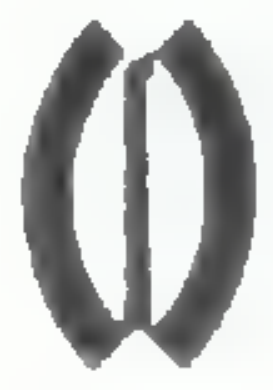
Have you every wondered about the meaning of the Garden's handsome symbol? It was designed by Chip Reay of Hellmuth, Obata, and Kassabaum, Inc. of St. Louis.



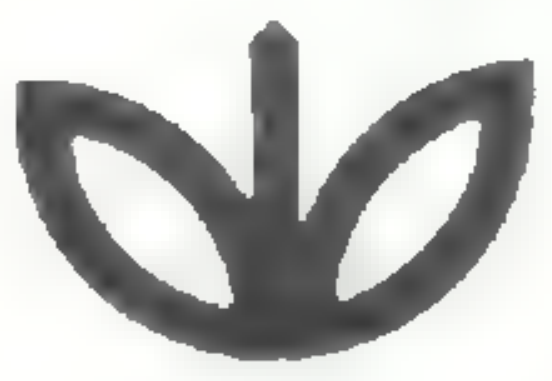
The genesis of the mark is the folk symbol for man.



Compounded to become men (mankind) abstracted to become plant form (botanical). Reflecting the Garden's dual concerns for man and the natural world. The inseparable nature of both and, most importantly, their "oneness." Also the process of research.

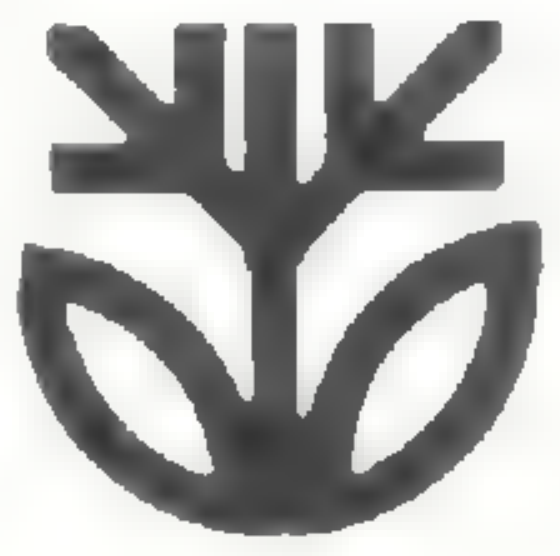


A seed pod.

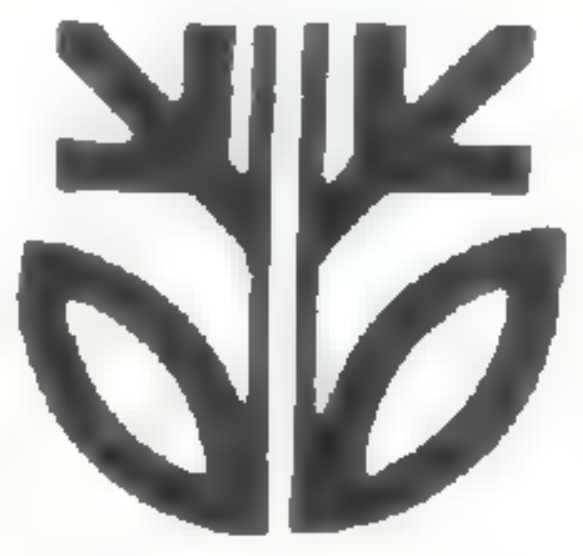


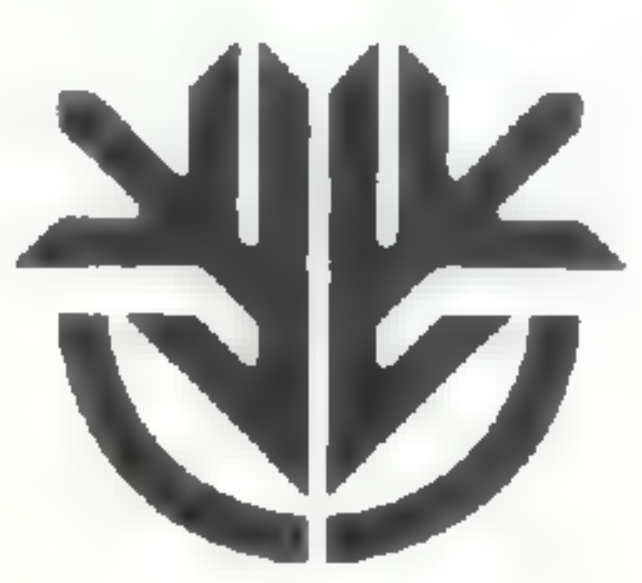
Germinating.

. Seeking the common denominator in the plant kingdom, the point at which most things look alike, so as to represent the entire kingdom and not one part . . . newness . . . growth.



The two forms brought together . . . and divided, symbolizing in their separateness plant and man, in their symmetry or reflection the interdependence of one upon the other to create a whole, a mutual reinforcement. Again, "oneness."





The curved lower line: the garden as holding, cradling, nurturing the whole: the earth.

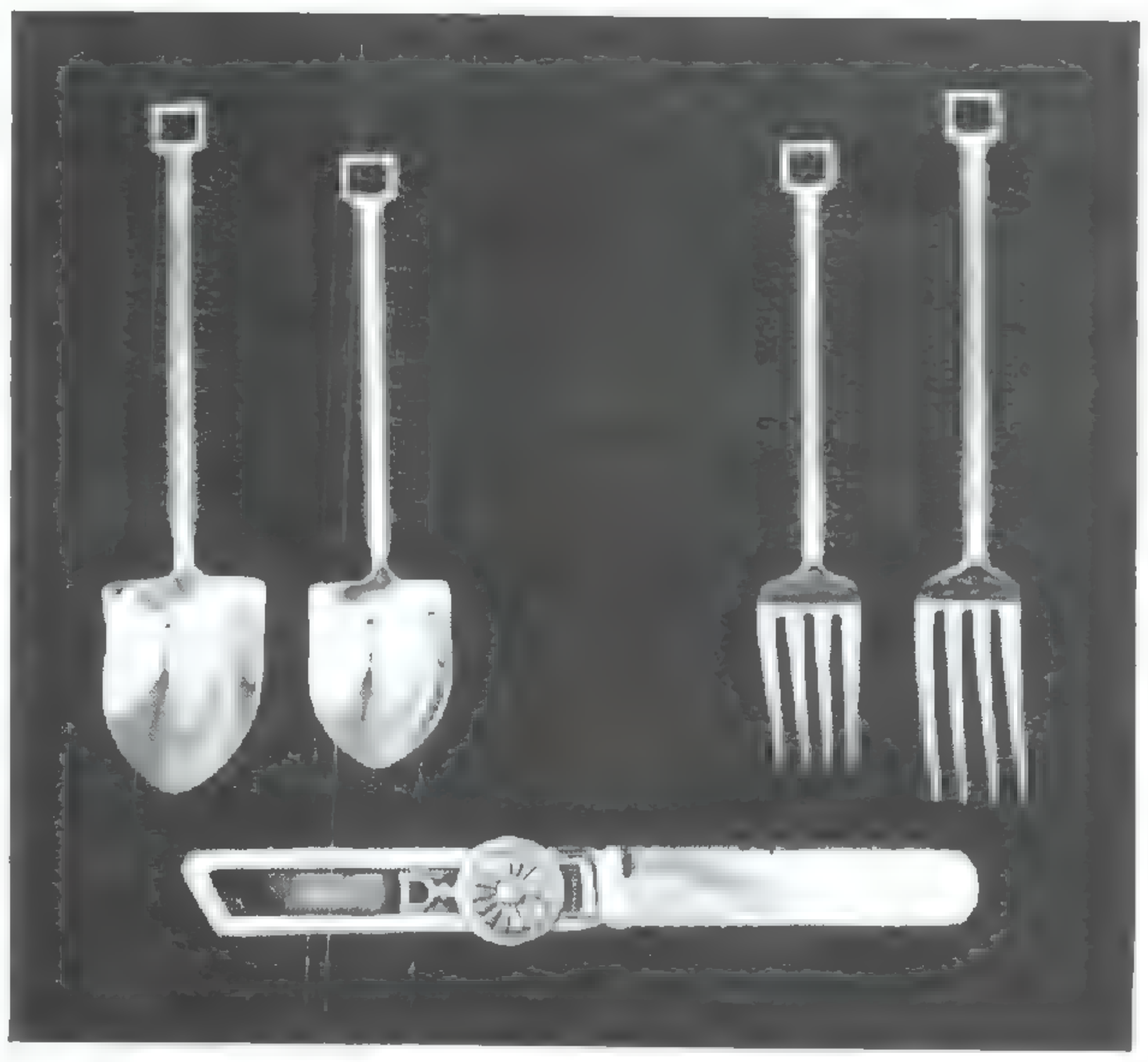
From the Garden Gate Shop

Mother's Day Is May 12

The Shop has a lovely selection of gifts and jewelry to honor your favorite Mom. Celebrate Mother's Day with a beautiful flowering plant, choosing from begonias, kalanchoes, azaleas, hydrangeas, Persian violets, gerber daisies, and many more. If Mom is an avid gardener, she will enjoy a gift from the Shop's extensive selection of outdoor gardening equipment and lawn ornaments.

Tee Shirts

Now that warm weather is here, everyone will enjoy a spiffy new tee shirt from the Shop's extensive selection. There are "Save the Rain Forest" shirts, the World Wildlife Foundation's "Endangered Species" shirts, and more. Just for kids is a charming new shirt featuring "Friends of the Garden."



Dig In!

A charming new item in the Shop is a five-piece set of stainless steel flatware called "Dig In's." The knife, forks and spoons are shaped like gardening tools, and make the perfect whimsical gift for the gardener "who has everything."

Award winners pictured at the Garden (left to right): Marguerite Ghant; George Kirkland; Rosa Little; Lois Williams; John Bieller, forester, Union Electric Company; Irene Frison; O. Sage Wightman III, president, MBG Board of Trustees.

Community Beautification Awards

The Garden, in cooperation with Union Electric Company, presented the 1991 Community Beautification Awards at a ceremony and reception held at the Ridgway Center February 24, 1991. The celebration was part of the Garden's Black History Month activities.

The 1991 awards winners were recognized for their contributions to improving neighborhoods throughout the St. Louis metropolitan area. Award-winners were nominated by individuals throughout the Greater St. Louis area. Nominees were evaluated by a committee of representatives from Operation Brightside, Operation ConServ, the Urban League, Better Family Life, Gateway to Gardening, Neighborhood Housing Services, Union Electric and the Missouri Botanical Garden.

"Each action taken to improve our world helps everyone in our world," said Dr. Peter H. Raven, director of the Garden. "And there is no better starting point

David N. Smith

1945-1991

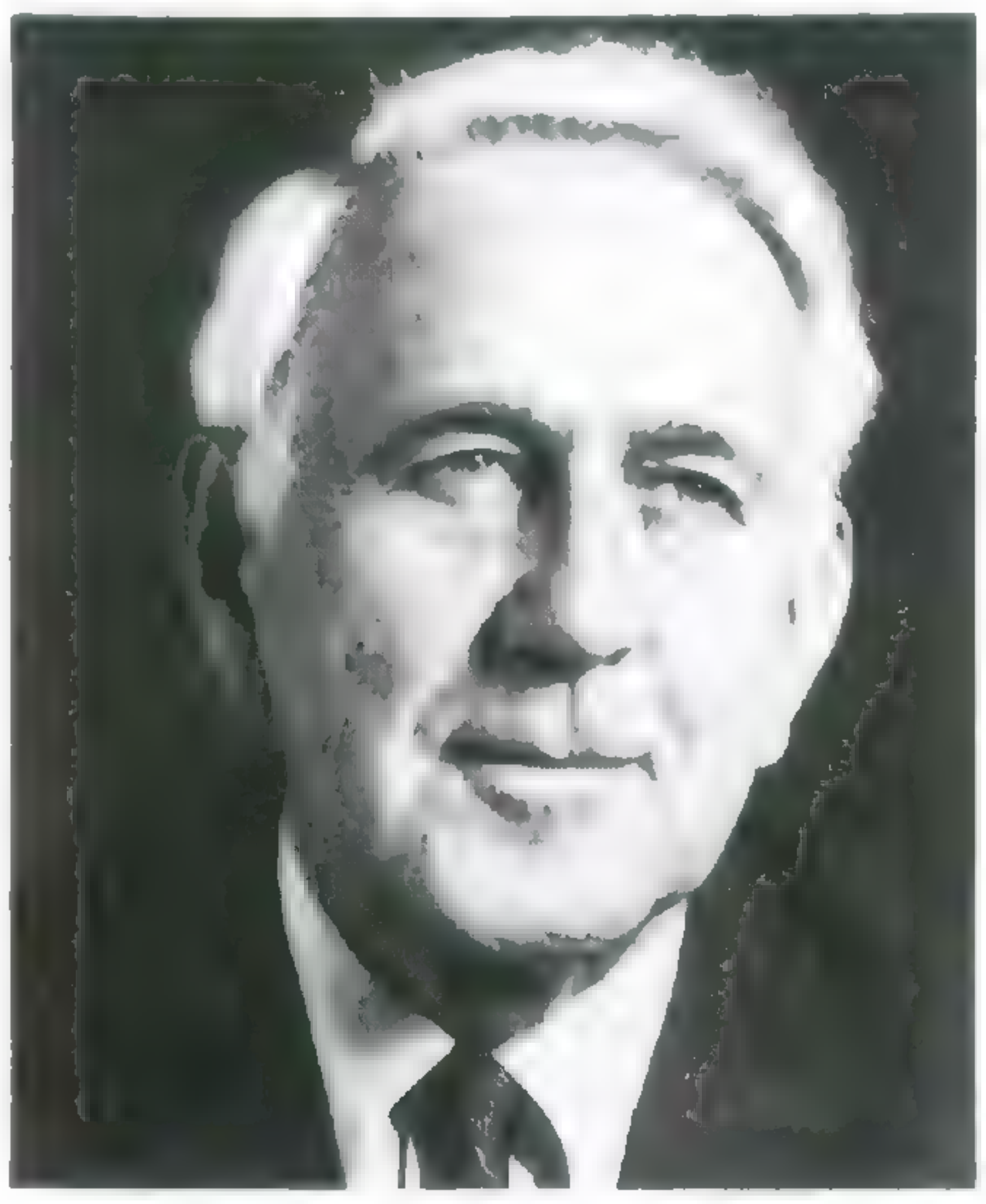
Dr. David N. Smith, assistant curator in the Garden's Research Division, died in La Paz, Bolivia on February 7, 1991. He had been stationed in Bolivia since early 1990, where he was directing a project to survey and inventory the tree flora of the Serrania de Pilón Lajas, in collaboration with the National Herbarium of Bolivia.

A native of Portland, Oregon, Smith came to the Garden in December 1989 from Iowa State University, where he received his Ph.D. in botany in 1988. His association with the Garden dates from 1982 when he became a research associate. From 1982 to 1986 he carried out botanical field work in various regions of Peru, developed a project to survey the flora of the Huascarán National Park, Peru, and collaborated with the Garden in its Flora of Peru project. Dr. Smith first became involved with the Latin American scientific and conservation community as a result of his years in Guatemala with the Peace Corps.

Dr. Smith was respected by his colleagues and co-workers for the quality of his botanical research and his dedication to the conservation of botanical resources in the Andean region of South America through research, promotion of public awareness of conservation issues, and education of local scientists. He will be greatly missed.

William L. Brown

1913-1991



Friends of the Garden were saddened to learn of the death of William Lacy Brown on March 8, 1991. The Garden honored Dr. Brown with the Henry Shaw Medal in 1986 in recognition of his achievements in plant breeding and genetics.

As a research scientist and as president and chief executive officer of Pioneer Hi-Bred International, Brown directed breeding programs for maize, sorghum, soybeans and wheat. World food production has benefited enormously from his research and the company's development of improved agricultural crop plants. While investigating the genetics of corn, Brown pioneered the exploitation of exotic germplasm for the crop's improvement. Hybrids from tropical plants led to significant improvements in domestic corn crops, and Brown's monographs on corn are standard references and models for commercial breeding research.

Brown became a research fellow at the Garden in 1937, earning his M.S. and Ph.D. degrees from Washington University. He joined Pioneer Hi-Bred in 1945. Upon his retirement in 1984 the company established the William L. Brown Postdoctoral Fellowship at the Garden.

Art Christ

1906-1991

"Art Christ was a magical individual," said Peter Raven, "who inspired hundreds of people because he loved to share his great enthusiasm for plants."

Staff, volunteers, and all friends of the Garden were saddened by the death of Art Christ on February 17. Christ grew up near the Garden and worked here as a gardener for several years after high school. He volunteered at the Garden and Arboretum for many years and was one of Missouri's most accomplished amateur botanists. He amassed an encyclopedic knowledge of the plants of Missouri and was often consulted by Garden researchers for help identifying plants.

"Art was a real storehouse of information for me," said George Yatskievych, editor of the Flora of Missouri project. "He could tell me exactly where things grow in this state. Art Christ was a gold mine, and he had a story about every plant."

Christ taught eighth grade general science for 18 years. He was a member of the Webster Groves Nature Study Society for 31 years and worked enthusiastically with a number of conservation groups.

Art's knowledge was developed in weekly explorations of Missouri's natural areas, and what he loved most of all was taking people on his walks and introducing them to the plants along the way. He amassed a collection of hundreds of dried plant specimens, which has been donated to the Garden.

Dr. Raven said, "Art Christ devoted his life to sharing knowledge with others. He made thousands of advocates and converts to the Missouri natural scene. He enriched all our lives, and we will miss him."

Orchid Collection Enhanced

Many new and exciting orchid plants have recently been added to the Garden's collection as a result of a generous donation from Mrs. Paul P. Mueller in memory of her mother, Mrs. Helen Dieckmeyer Koerner. Marilyn LeDoux, the Garden's orchid horticulturist, is delighted with the opportunity to enlarge and diversify the orchid collection. The Garden is very grateful to Mrs. Mueller for this support.

Trustee Profile

Richard J. Mahoney

On January 24, the Missouri Botanical Garden Board of Trustees elected Richard J. Mahoney, chief executive officer of the Monsanto Corporation, to the Garden's Board. "Having Mr. Mahoney join our Board of Trustees will help the Garden in many ways," said Peter H. Raven, director. "His leadership in the St. Louis community is extremely valuable and his tenure with Monsanto will certainly benefit our research and scientific mission."

Mr. Mahoney became associated with Monsanto Company in 1962 as product development specialist. Subsequently he has held numerous positions throughout his years with the firm. He became executive vice-president in 1977, was elected to the Board in 1979, and elected as president in 1980. Soon after, he assumed the additional duties of the chief operating officer, and was appointed to his present position as chairman and chief executive officer in April of 1986.

A graduate of the University of Massachusetts with a degree in chemistry, Mr. Mahoney has maintained his commitment to his alma mater by serving as a member of the Chancellor's Executive Council and the Development Committee. He has also taken on numerous responsibilities in the metropolitan St. Louis area and is presently a member of the Advisory Board at St. John's Mercy Medical Center, a member of the University of Missouri-St. Louis CEO's Council, a Trustee at Washington University-St. Louis, and a vice-president of the Board of Managers at the Central Institute for the Deaf in St. Louis, to mention a few.

"I am delighted that Mr. Mahoney has found it possible to join us as a member of the Board of Trustees and know that his continuing interest in the Garden's scientific endeavors will be of benefit to everyone," said O. Sage Wightman III, the Board president.

Mr. Mahoney and his wife, Barbara, have three children.

Touhill Named New Chancellor of UMSL

Dr. Blanche Touhill recently was named chancellor of the University of Missouri-St. Louis. She had served as interim chancellor since August 1990. Dr. Touhill had been a member of the Garden's Board of Trustees by virtue of her office, and her recent appointment ensures that the Garden will continue to benefit from her expertise. Dr. Raven said, "We are delighted to have Dr. Touhill continue to serve on our Board. She is a distinguished educator, and we congratulate her on her appointment."

TIM RYAN

FLORA OF NORTH AMERICA is putting the finishing touches on Volume I, scheduled for publication in 1991. Volume I will contain introductory chapters, ferns, and gymnosperms. Recently some of the contributors to the project spent several weeks at the Garden editing introductory chapters. Shown in the Garden library (left to right): Nancy Morin, MBG; Theodore Barkely, Kansas State University, Manhattan; Luc Brouillet, University of Montreal; and Rich Spellenberg, New Mexico State University. Not pictured: David Whetstone, Jacksonville State University.

Tributes

JANUARY - FEBRUARY 1991

In Honor Of

Mrs. Dorothy Anderson
Friends at Lee-Rowan Company
Mr. and Mrs. Harry Bobroff
Mr. and Mrs. Phillip Schreiber
Mr. and Mrs. John Bottchen
Mr. and Mrs. Blaine A. Ulmer
Mr. Paul Brockman
Mr. and Mrs. William R. Orthwein Jr.
Daniel Elliot Bronson
Mr. and Mrs. George J. Amitin

continued on next page

Gift Planning

The Last Word...

How would you like a chance to tell everyone exactly what to do? You can do that with a Will. Through your Will you can direct how your estate is to be distributed at your death.

If you don't have a Will your estate will be settled according to the state's laws of descent and distribution—impersonal laws, that have no regard for what you may have had in mind.

The Garden is offering a free booklet that can answer many of the questions you may have about Wills: "Your Will, Your Way . . . Why and How." This comprehensive publication explains why you need a Will, how to prepare to meet with your legal advisor, what items to include in your Will, and more. For your free copy call 577-9532.

Moving? Please Remember To Send Us Your New Address.

To avoid missing any of your membership mailings, you *must* give us your new address at least three weeks *before* you move. Please enclose the mailing label on the back cover of this *Bulletin*, and mail to: Membership Office, Missouri Botanical Garden, P.O. Box 299, St. Louis, MO 63166.

Name:____________________

Old Address:

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City____________________

State__________Zip__________

New Address: (Date effective:__________)

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City____________________

State__________Zip__________

Tributes

continued

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Doris Wegener
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Mr. and Mrs. Don Friedman

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CELEBRATE WITH FAMILY & FRIENDS

NOON TO 7 P.M.

Presented by

MISSOURI BOTANICAL GARDEN & TOWER GROVE PARK

Bring the whole family and enjoy a fun day with the Scott Air Force Starlifter Band, the Compton Heights Band and other music groups, plus food, clowns, carriage rides, a barbershop quartet, the ''MoBot Express'' Garden tour for children, pony rides, hands-on activities for children, and other delightful entertainment.

Picnic in Tower Grove Park and the Missouri Botanical Garden.

Free admission all day long.

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On the cover: Koi, *the carp, are a popular feature of the Japanese garden.*
—Photo by King Schoenfeld

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Comment

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A Landmark Summer

The opening of the William T. Kemper Center for Home Gardening was an historic occasion and 4,500 Members were among the first to tour the facilities on June 8. The Center has been on the drawing board for almost 20 years, since the Garden adopted the 1973 Master Plan that guides our remaining physical development through the end of this century. We were delighted with the interest and enthusiasm shared by so many who joined us for the Members' Preview. We are confident that Members will find the Center packed with valuable information about plants and about how this store of knowledge can be applied so that people may improve their lives, whether that be for aesthetic purposes, for food self-sufficiency, or to promote the health of one's immediate environment.

The Garden's Members' Board coordinated the activities for the Members' Preview of the Center and their organizational talent and leadership made the opening a delightful experience. The Members' Board involvement in special members activities, such as the Center for Home Gardening Preview, has significantly strengthened the membership program over the past several years.

For another first of its kind, the Garden and Tower Grove Park, under the outstanding leadership offered by the Garden's Members' Board and the Friends of Tower Grove Park, are poised for the "St. Louis Old Fashioned Fourth" excitement. We invite you to join us for a delightful afternoon featuring entertainment, a wide array of speciality foods, and a taste of old fashioned fun.

The "Festival of Festivals" should encourage you to visit at least once during August. Each weekend the Garden will celebrate the culture of a different country with the traditional Japanese Festival taking place the first weekend of August, followed by a wonderful celebration of Greek, English, and Caribbean cultures (see page 11). This revised format from the former 10-day Japanese Festival offers varied programs and entertainment each weekend so that the exciting cultures of a wide range of countries can be experienced.

Come and visit the Center and enjoy the other festivities throughout the summer.

Peter H. Raven

PAUL KOHL MEMORIAL GARDEN
MISSOURI BOTANICAL GARDEN
1991

CLIFF WILLIS

PAUL KOHL MEMORIAL GARDEN—On May 20, 1991, Garden Trustees, staff and friends dedicated the new park at the northwest corner of Shaw Boulevard and Tower Grove Avenue in the memory of Paul A. Kohl, long-time Garden horticulturist. Pictured at the ceremony are members of the Kohl family (left to right): Julia Kohl; Paul R. Kohl; Susan Waldron; Barbara Van de Reit; Rosalie Buckley; O. Sage Wightman III, president of the Board of Trustees; Peter H. Raven, director; Peggy Mehan.

Anne Lionberger Lehmann

1894—1991

The Garden lost one of its oldest friends on May 21 with the death of Mrs. Anne L. Lehmann. She and her husband, the late John S. Lehmann, enrolled in a botany course at the Garden in the spring of 1931, and their interest and involvement with the Garden grew and lasted a lifetime.

Mr. Lehmann, who was president of Petrolite Corporation, became a member of the Board of Trustees in 1940 and served until 1958. He was president of the Board of Trustees from 1953 to 1958, and served briefly as acting director of the Garden. He became an Honorary, or Emeritus Trustee, in 1965. Following Mr. Lehmann's death in 1967, Mrs. Lehmann continued his long tradition of devotion to the Garden.

Peter Raven said, "The Garden would not be what it is today without Mrs. Lehmann's many activities and financial contributions. She helped reshape the Garden and make it the active, beautiful place we all enjoy so much."

She was instrumental in forming the Women's Committee of Shaw's Garden and served on the Women's Executive Board of the Friends, both early efforts to increase community awareness of and participation in the Garden and its activities. Both of these bodies have been absorbed into our present, successful Members' organization.

Her substantial contribution to the Garden's first capital campaign, begun in late 1967, helped make possible the construction of the research building, the John S. Lehmann Building, opened in May 1972. The presence of this beautiful and still-modern facility has allowed our important research and exploration activities to expand greatly in the nearly twenty years of its existence. A major renovation of the Lehmann Building completed in 1986 was also helped by Mrs. Lehmann's generosity, and she supported ongoing research activities by the staff as well. As the Lehmann Building was being completed, it was realized that additional greenhouse space would be needed for the expanded research programs, and Mrs. Lehmann contributed funds to construct this facility near the Lehmann Building. To honor her contributions to the research program, *The Unseen Garden*, a beautiful publication describing these programs, was dedicated to her in 1987.

Continuing Mr. Lehmann's long interest in roses, Mrs. Lehmann helped substantially with the establishment of the large rose garden that now bears her name. This garden, displaying over 4000 roses, was dedicated in 1976, and its continued development won it the 1983 All-American Rose Selections Public Rose Garden Award.

Another display area in which Mrs. Lehmann was active is Tower Grove House. After 1889, the House was used as the director's residence and for other administrative functions. It was not open to the public until Mrs. Lehmann helped form a committee that raised funds to refurbish the House, and it was opened to the public in 1953. Mrs. Lehmann's interest in the House continued through the years, and she served on the Historical Committee, which continues in the ongoing restoration and maintenance of the House.

To honor Mrs. Lehmann's support and activities, the Garden's Board of Trustees presented her its highest honor, the Henry Shaw Award, in 1981. She was the first woman to receive this award. In 1984, the Garden's Board of Trustees took the unprecedented step of electing her an Emeritus Trustee. No other person has been so elected without first having served as an active member of the Board.

Mrs. Lehmann's financial contributions were enormous. Yet she was modest about them. After being thanked for a contribution in 1981, she wrote the director, "I don't think I deserve any thanks, as the little I have done for the Garden has come back to me many times in dividends of pleasure."

—Marshall R. Crosby, Ph.D.
Assistant Director

ROBERT C. HOLT, JR./ST. LOUIS POST-DISPATCH

The Lehmann Rose Garden was dedicated June 4, 1976. Mrs. Lehmann is shown standing in the garden that was named in her honor that evening.

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▼
"Breakfast With Tiffany's" was a highlight of the 1988 Fragrance Festival, chaired by Nora Stern.

PATRICK WATSON

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▲
Purple Martin Evening celebrated its 10th anniversary in 1991. Every year hundreds of members turn out to welcome the return of these popular birds. Chairwoman Jane Tschudy (left) and Purple Martin Curator W. Ashley Gray III chat with Zapper, the star of the evening. Not pictured: co-chairman Ann Bowen.

▶
Ted Atwood, treasurer, with his daughter Kate at a Halloween MoBot Fun Day.

L. A. KELLY

A Salute to the Members' Board

Extraordinary commitment by dedicated individuals builds a thriving Garden for the community.

"Without our Members and the leadership provided by the Board, the Garden could never be the wonderful place it is today," says Brenda Banjak membership coordinator. "The Board Members give extraordinary service to the Garden and to the community. They are a dynamic group to work with, and someone is always coming up with a great idea — the only probler is keeping up!"

The past few years have seen tremendous achievements and unparallele activity by all of the members of the Board. Pictured here are some highlights and some of the men and women whose efforts have strengthened the Membership Program and enhanced the Garden for the entire community.

L. A. KELLY

▲
Sue Rapp (left), president of the Members' Board, leads the Festivities at the 1990 Mothers' Day luncheon. Chairmen were Patty Arnold and Mary Longrais.

▶
"Gardening and Entertaining with Martha Stewart," held at the Adam's Mark Hotel, was one of the most popular events of 1990, raising $38,000. The committee, shown at the home of chairman Barbara Cook, were (top row:) Sue Rapp, Mary Longrais, Nora Stern, Peggy Lents, Suzy Grote. Middle row: Holly Blumeyer, Sue Oertli, Ellen Dubinsky, Barbara Cook, Isabelle Morris, Mim Kittner, Susie Schulte. Front row: Ann Bowen, Ginny Senkosky, Holly Brigham, June Kummer, Mary Randolph Ballinger.

L. A. KEL

▶

The Membership Services Desk in the Ridgway Center has been extraordinarily effective in making visitors feel welcome. Fifty-one volunteers at the Desk sold 29 percent of all new memberships in 1990, giving 2,286 hours of service. Garden membership increased by eight percent, to an all-time high of 27,386. Shown here, Polly Raith (right) signs up another new member.

CLIFF WILLIS

RICHARD BENKOF

◀

Mim Kittner, left, with volunteer coordinator Jeannie McGilligan, at Volunteer Evening 1989. Mim accepted a special recognition award on behalf of the volunteers at the Membership Services Desk.

▼

The 1990 Safari Party celebrating the reopening of the Climatron in late March featured zoo animals, Caribbean music, fanciful decorations and an enormous crowd. Chairman Sue Oertli (left), in safari attire, is shown with her daughter Gale Judd.

◀ *Rose Evening is an annual tradition that becomes more popular every year as members and their families fill the Garden to picnic and enjoy the rose gardens. Pictured here, Patty and Todd Arnold present guests with a long stemmed red rose.*

RICHARD BENKOF

◀

Carriage rides were popular at the celebration of Henry Shaw's Birthday, July 24, 1989.

RICHARD BENKOF

▲

The 1990 Garden Tour chairmen were (left to right): Ann Bowen, Mary Randolph Ballinger, and Ellen Dubinsky. The tour highlighted nine private gardens and raised over $25,000.

RICHARD BENKOF

◀

"Encore! A Garden Gala with Bobby Short" was a highlight of the summer of 1989. Chairman Nora Stern, shown here with Bobby Short, helped to raise over $120,000 for the Garden.

PAST PRESIDENTS OF THE BOARD shown at the 50th Anniversary Reception October 1989 (left to right, front row): Mrs. James Alfring (Mary Ella), Mrs. William Bixby (Helen), Mrs. Henry W. Dubinsky (Ellen), Mrs. Landon Y. Jones (Ellen). Left to right, back row: Mrs. Walter G. Stern (Nora), Mrs. Shadrach F. Morris (Isabelle), Mrs. Charles W. Oertli (Sue), Mrs. Robert H. Kittner (Mim).

MEMBERS' BOARD

continued

PATRICK WATSON

Members' Days are popular monthly events just for members. Many Members' Days events are lectures and programs held in Shoenberg Auditorium (left). The Early Morning Stroll and other special tours bring out members of all ages and interests (above, right). Members' Musical Evening (right) is a highlight of summer.

L. A. KELLY

Corporate Philanthropy Profile

The Monsanto Fund

Monsanto Company recognizes its responsibility to be a good corporate citizen by enhancing society's vitality and quality of life. In doing so, it seeks to earn acceptance and respect as an effective, caring corporate citizen everywhere it operates around the world.

For more than two decades the Company has relied upon Monsanto Fund, the Company's philanthropic arm, to help enrich the communities of which Monsanto is a part and to help the Company earn its place in society.

This year, Monsanto Fund will contribute more than $16 million to non-profit organizations in the United States and around the world. Additional donations of equipment, in-kind services, and loaned executives will represent several hundred thousand dollars more.

''In Monsanto's philosophy, the health of a corporation is very much tied to the health of the communities in which it operates,'' observed O. Sage Wightman III, president of the Garden's Board of Trustees. ''Monsanto is genuinely concerned with the quality of life in its operating locations, both here and abroad, and because of this concern it has been instrumental in creating that very quality of life. I can think of no better example than St. Louis, the company's headquarters, which has benefited inestimably through the years from Monsanto's involvement.

''Monsanto and the Missouri Botanical Garden share more than St. Louis as our home,'' John L. Mason, President, Monsanto Fund, said. ''We share an interest in world class science. At Monsanto, we value not only the beauty the Garden brings to thousands of people, but the discipline and professionalism with which the Garden undertakes meaningful projects. Monsanto Fund values the personal partnerships with the Garden that have resulted from more than 20 years of collaboration.''

Monsanto Fund places a heavy emphasis—nearly 40 percent of all grants awarded—on science education, where the need for programs of depth and excellence, at all scholastic levels, is essential if America is to remain internationally competitive in the next century. The Fund is keenly interested in supporting ''catalyst'' programs, that is, those yielding measurably increased or enhanced results.

Social services, at about 30 percent of total awards, also are very important to the Fund. The balance of grants made are in the areas of arts and humanities, health, and youth and community projects, as well as through employee matching gifts.

Remarked Peter H. Raven, ''The Garden plays a number of roles—as a cultural, educational, and research institution—and we have been extremely fortunate for Monsanto's long-standing work with us in each of these sectors. We have received Monsanto support for our research and education efforts since the 1970s, most recently in the form of a major contract to locate plants with substances of potential medicinal use.

''The Fund has also been a generous supporter of several very important construction drives over the past 25 years. With the Fund's help, we have built and renovated the John S. Lehmann Building, our research facility; built the Ridgway Center, with its main barrel-vaulted space, Monsanto Hall; and built the William T. Kemper Center for Home Gardening, in which Monsanto supported the entrance gallery.

''We are absolutely delighted to be associated with such a foresighted organization and look forward to many more years of their colleagueship in learning and transmitting important information about our environment and the scientific aspects of our world.''

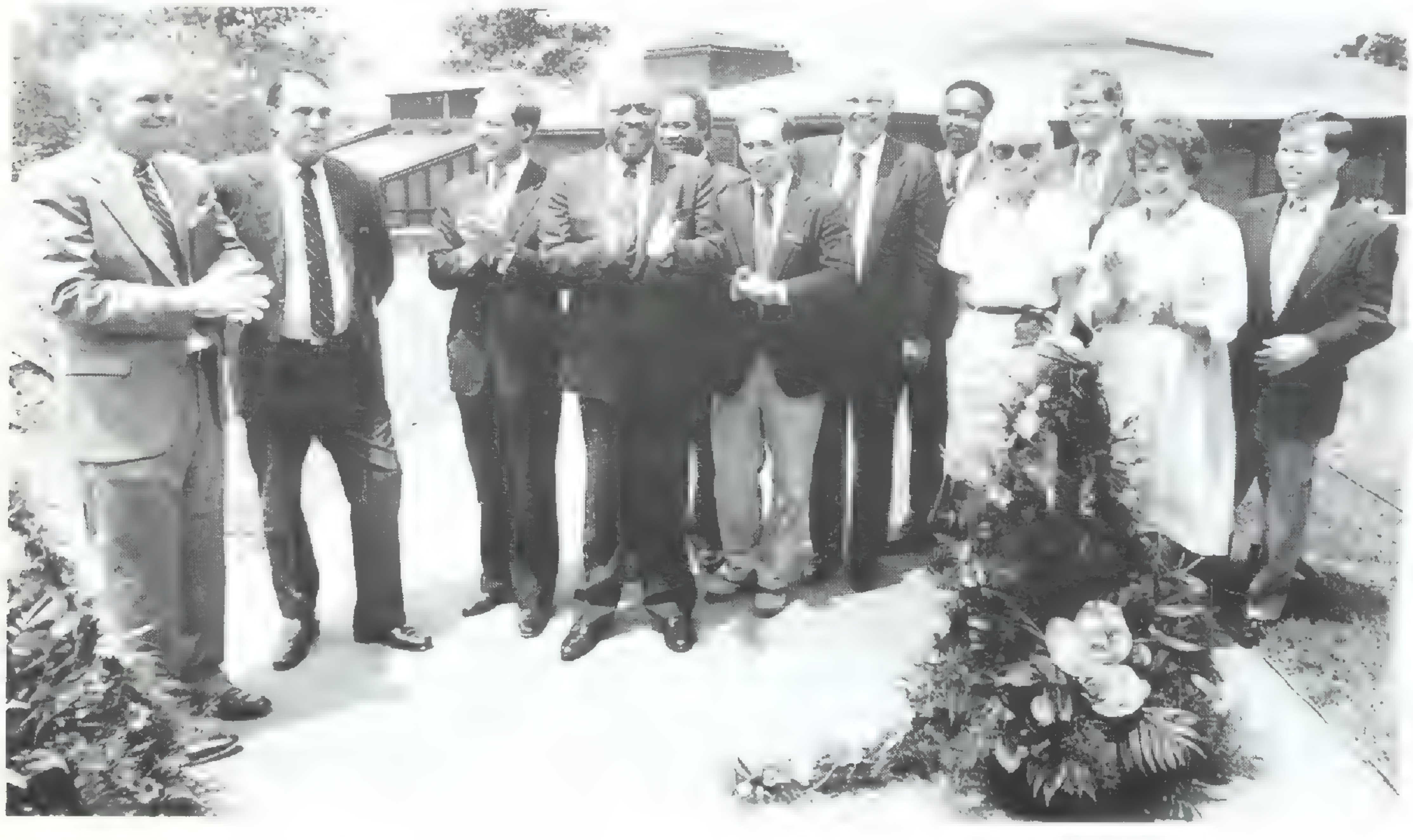
WILLIAM T. KEMPER CENTER FOR HOME GARDENING

GRAND OPENING

Visitors crowded into the Center to enjoy and learn from exhibits, living plant displays, resource materials, video displays, the Plant Doctor, Master Gardeners and more.

A beautiful summer weekend welcomed crowds of members and visitors to the members' preview on June 8 and the dedication ceremony June 9, 1991, for the Kemper Center. Speaking at the ceremony on Sunday were Peter H. Raven, director; Joan Kelly Horn, U.S. Representative, 2nd District; O. Sage Wightman III, president of the Board of Trustees; Michael D. Fields, executive director of the William T. Kemper Foundation; John L. Mason, president, Monsanto Fund; Louis R. Saur, architect for the Kemper Center; Rufus Jones, chair, research director and administrator, University Extension; John F. Bass, Missouri State Senator, 4th District; Thomas P. Stoff, Missouri State Representative, 64th District; and Stephen J. Conway, Alderman, 8th Ward, and Geraldine F. Osborn, Alderman, 15th Ward, City of St. Louis.

In his remarks, Dr. Raven said, ''In future decades it will be increasingly essenial that we properly manage the natural resources found in our own backyards, ust as we seek to conserve those deemed part of the public birthright . . . A great number of members, friends, corporations, and foundation made the Kemper Cener possible through their generous gifts and enthusiastic support. [They] have not simply given us a building—[they] have given us the means to serve the broadest possible spectrum of groups in our community as we seek to enrich our daily lives nd deal kindly with our Earth.''



Above: Crowds lined up to enter the Kemper Center both Saturday and Sunday. Left: Applauding the cutting of the garland of vegetables, flowers and greenery are (left to right): Peter Raven; O. Sage Wightman III; Michael Fields; John Bass; Rufus Jones; Steven D. Cline, manager of the Center; Louis Saur; John Mason; Joan Kelly Horn; Tom Stoff; Geraldine Osborn; Stephen Conway.

KEMPER CENTER HOURS:
10 a.m. to 4 p.m., seven days a week. Master Gardeners will be available Monday through Saturday only.

Home Gardening

Mulches

Traditionally we think of mulch as material used to protect plants during winter. But mulch also conserves moisture, improves the soil, and is a means of recycling yard waste.

Forests go through a natural process of providing their own mulch. Leaves, evergreen needles and bark layer the forest floor to provide a covering of rich organic materials. This plant debris will decay over time recycling nutrients back into the soil, insulating it from heat and cold, conserving soil moisture and acting as a weed barrier. When we mulch our gardens, we simply follow nature's practice and receive all the benefits.

ORGANIC MULCHES

The most common organic mulches include peat or sphagnum moss, wood chips and shavings, sawdust, shredded or chipped bark, straw, hay, lawn clippings, pine needles or limbs, corn cobs, paper and newsprint, and leaves. Garden centers offer a wide assortment of different types of packaged organic mulches as well as some regional specialities such as rice hulls, walnut shells, peanut hulls or cocoa bean shells.

In summer, organic mulches keep the ground cooler in the daytime and warmer at night. In winter, they keep the ground warmer and less subject to heaving. The greatest value of organic mulch is a continual addition of organic matter to the soil, which improves soil structure and the quality of the rooting zone by opening up air spaces and stabilizing the soil moisture. At the end of the season organic mulches can be left in place. Alternatively, synthetic mulches should be taken up after each growing season.

SYNTHETIC MULCHES

Synthetic mulches include clear or colored polyethylene plastic films and spun or woven polypropylenes, more commonly known as landscape fabrics. You could also include in this category carpet pieces and heavy duty aluminum foil, which some people continue to use. These can be quite effective in suppressing weeds and conserving moisture.

In contrast to organic mulches, synthetic mulches tend to keep the soil even warmer in summer because they magnify and trap heat. The degree of heating depends upon the type of synthetic mulch and its color. Clear plastic raises the temperature the most. Temperatures may reach about 10 degrees higher than bare soil in summer. Black plastic will raise the soil temperature about five degrees, while other materials listed as synthetic mulches only elevate soil temperatures by one or two degrees.

Dark colored plastic mulches will enhance weed suppression and may increase yields of heat-loving crops like peppers, tomatoes, and melons. They also retain more moisture than other mulch materials, and they are convenient to acquire and use.

However, plastic mulches have some important disadvantages. They make it hard to regulate soil moisture, and the plastic traps air and water and does not allow roots to breathe. Plastic should only be used as a short-term mulch between rows of vegetables or around small fruit trees. It should always be removed at the end of the growing season, and this may be difficult as UV light from the sun makes plastic brittle if it has not been covered with a light surface mulch.

As an answer to these problems, a new synthetic material made from polypropylene or polyester has been developed. This material is permeable to air and water, but blocks light so that most broadleaf weeds are suppressed with the exception of very aggressive grasses and nutsedge. Landscape fabrics can be used around perennial plantings because they allow more air exchange in and out of the soil. They generally last for many years provided that they are covered with some other materials like bark chips or rock. Fertilizers can still be applied by traditional methods and move through the fabric without difficulty. However, they generally cost more than plastic films.

INORGANIC MULCHES

A layer of gravel or pebbles is often applied in areas where the most durable mulch is required. These materials make it difficult to work in soil amendments and they do not control weeds well, but they are relatively inexpensive and should be considered as a permanent mulch for woody planting beds.

APPLYING ORGANIC MULCH

Organic mulches should be placed around annuals only after the soil has warmed up in the spring. If they are applied too early, they will block the sunlight and the soil will remain cold, slowing plant growth. The best time to apply organic mulch is after mid-May in the St. Louis area.

Generally a three-inch layer of compost, chipped or shredded bark or peat moss is sufficient to protect against moisture loss and temperature fluctuations in the summer. If hay or straw is being used, increase the layer depth to four

TEN BENEFITS OF USING MULCH

1) Helps control weeds.
2) Regulates soil temperatures.
3) Retains moisture.
4) Reduces soil erosion.
5) Reduces plant diseases and fruit rot.
6) Adds nutrients to the soil.
7) Improves soil tilth.
8) Reduces heaving of soils from frost.
9) Protects against soil compaction.
10) Improves the appearance of any planting site.

to six inches. This material tends to be loose and packs down with time.

Grass clippings must be mixed with coarser materials, as they tend to pack down and repel water. Mix grass clippings with leaves, wood chips or some other brown plant debris and let age for two to four weeks. Watch out for clippings that have been treated with broadleaf herbicide. They may affect the plants you mulch, especially tender and actively growing vegetables.

Apply mulch to perennials after the first frost about mid-November. Whole strawberry plants should be covered with four to five inches of straw in the fall. Rose canes cut back to 18 inches in the fall should be covered to a depth of about eight inches with straw or similar material to protect the crowns.

APPLYING SYNTHETIC MULCH

Plastic layer mulches should be laid down at or before planting time. The real value of plastic is that it can warm a spring soil very quickly. This allows you to plant early in the season if the tops of your plants are protected in some other way. Before applying a plastic mulch, the soil should be fertilized and tilled. Once the plastic layer is in place, fertilization and soil moisture is more difficult to regulate. Small cuts in the plastic may solve the problem. Water the area and watch where the water collects in low areas. This is where the cuts should be made. Secure the edges of the sheet.

Some gardeners may wish to cover the entire planting surface prior to transplanting. In this case, holes must be punched in the sheeting with a knife in order to plant.

Landscape fabrics are typically woven and need not be replaced annually. It is best to cover the fabric with rock, straw, or wood chips so that UV light will not make it brittle.

MULCH TYPES FOR DIFFERENT CROPS

Organic mulches tend to keep the soils relatively cool in the spring and these work best for cool-season crops such as beets, broccoli, cabbages, carrots, cauliflower, kohlrabi, lettuce, onions, peas, potatoes and spinach. Synthetic mulches tend to warm the soil and are best used with warm-season vegetables such as tomatoes, peppers, squash, okra, peppers, pumpkins and eggplants.

The mulch you choose for each gardening purpose should be readily available for reasonable cost. Also consider whether the mulch needs to last for more than one season. Those which are more durable can be used with perennials and woody ornamentals.

—Steven D. Cline, Ph.D.
Manager, Center for
Home Gardening

Timely Tips from the Answer Service

Do you have a plant question? Call the Horticultural Answer Service, Monday through Saturday, 9 a.m. to noon, at ***577-5143.***

July Tips

- Provide water in the garden for the birds, especially during dry weather.
- Keep weeds from making seeds now. This will mean less weeding next year.
- Keep deadheading spent annual flowers for continued bloom.
- Apply no fertilizers to trees and shrubs after July 4th. Fertilizing late may cause lush growth that is apt to winter kill.
- Don't pinch mums after mid-July or you may delay flowering.
- Summer pruning of shade trees can be done now.
- Blossom-end rot of tomatoes and peppers occurs when soil moisture is uneven. Water when soils begin to dry; maintain a two to three inch layer of mulch.
- Water lawns frequently enough to prevent wilting. Early morning irrigation allows turf to dry before nightfall and will reduce the chance of disease.
- While spraying roses with fungicides, mix extra and spray hardy phlox to prevent powdery mildew.
- Fertilize container plants every two weeks with a water soluble fertilizer.
- Prune climbing roses and rambler roses after bloom.
- Hot, dry weather is ideal for spider mite development. Damage may be present even before webs are noticed. With spider mite damage, leaves may be speckled above and yellowed below. Evergreen needles appear dull gray-green to yellow or brown.

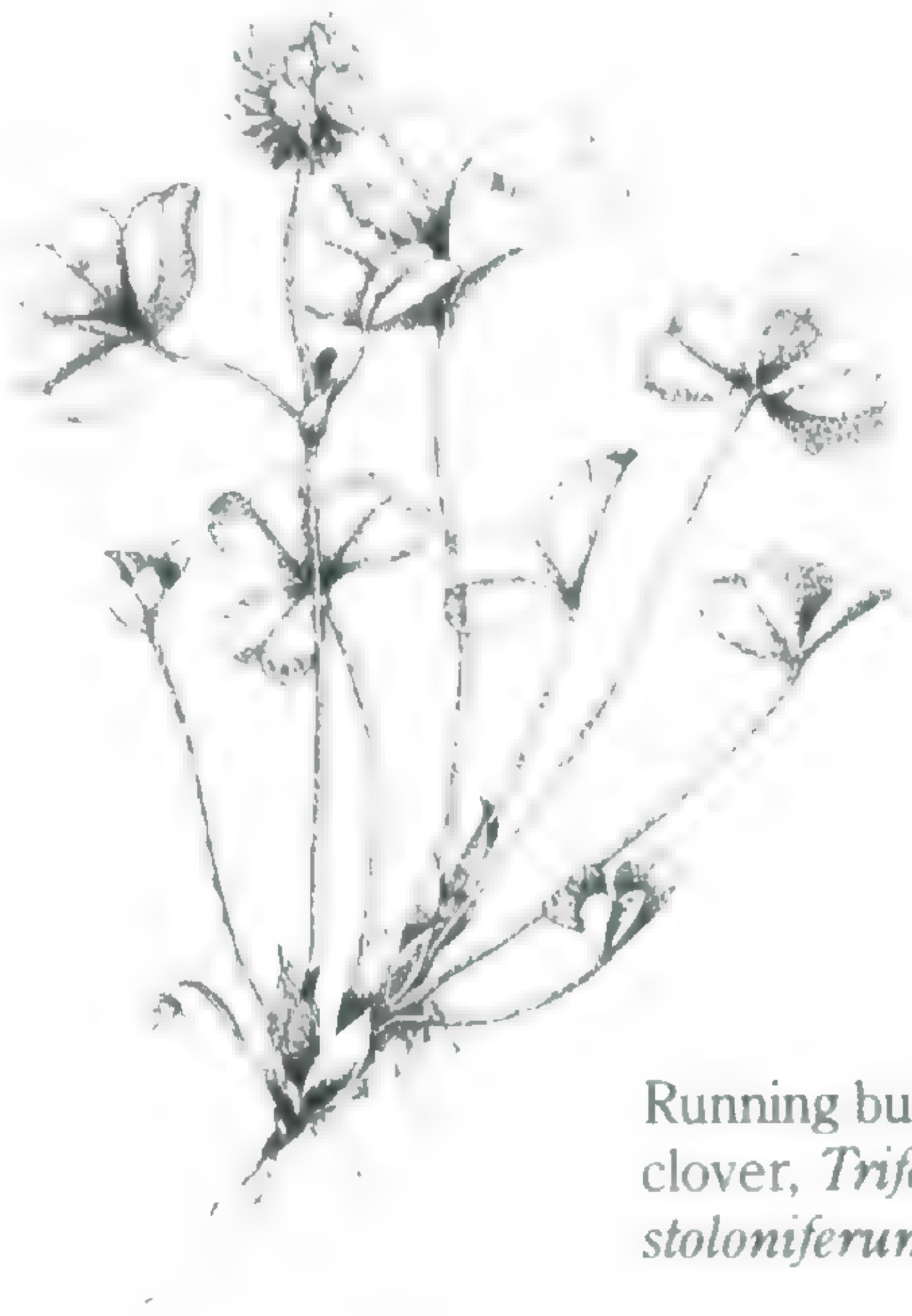
August Tips

- Deadhead annuals and perennials as needed.
- Roses should receive no further nitrogen fertilizer after August 15th.
- Divide bearded iris.
- Annuals may appear leggy and worn. They can be cut back and fertilized to produce a new flush of bloom.
- Evergreens can be planted or transplanted now to ensure good rooting before winter arrives. Water both the plant and the planting site several days before moving.
- Prune to shape hedges for the last time this season.
- Zoysia lawns can receive their fall fertilizer application.
- Dormant lawns should be soaked now to encourage strong fall growth.
- Soak shrubs periodically during dry spells to a depth of eight to ten inches.
- Feed mums, asters and other fall-blooming perennials for the last time.
- Sow seeds of beans, beets, spinach & turnips now for the fall garden. Spinach may germinate better if seeds are refrigerated for one week before planting.
- Compost or till under residues from harvested crops.

—Chip Tynan, The Answer Service

Center for Plant Conservation

EDITOR'S NOTE: This report on the Garden's work with the Center for Plant Conservation is the first in a series by Dr. Lucile McCook, who joined the staff in February as horticultural taxonomist. The Garden is one of 20 botanical institutions participating in the Center's National Collection.



WAYNE PAGE

Running buffalo clover, *Trifolium stoloniferum*

You Can Run, But You Just Can't Hide

By Lucile McCook, Ph.D.

The saying is true, at least, for the running buffalo clover, *Trifolium stoloniferum*. Once widely distributed and abundant in Missouri, this species had not been found in our state since the turn of the century. However, this spring six plants were discovered in the yard of the botanist who is writing the new Flora of Missouri!

Dr. George Yatskievych, a botanist with the Missouri Department of Conservation, conducts his work on Missouri plants in the research department of the Garden and lives in the Shaw Neighborhood. Last year, George bought a load of topsoil to enrich his clay-filled flower beds. As he was spreading the topsoil and pulling out a number of "weeds" that had come up in the load, he noticed several small clovers that looked different from the common species he would have expected to find. Luckily for us, George left them in place until they bloomed in late April, and he positively identified them as *Trifolium stoloniferum*, the only known population of running buffalo clover in the state.

And so the search was on. After learning that the topsoil had come from a site along the Meramec River in Jefferson County, a search party was assembled from the staff of the Garden and the Missouri Department of Conservation. Two days were spent combing the area, but no plants were found of this clover that had once occurred in abundance from Oklahoma to West Virginia.

In the absence of a viable population of running buffalo clover, how can we explain the six seedlings? Possibly, the soil contained seeds in its "seedbank" that only germinated when the soil was disturbed and the seeds were exposed to heat and light. The seeds could have been washed in from a population farther upstream, where we know the clover once existed.

At any rate, the six seedlings are already being used to further our efforts to save this endangered species. A single leaf from each plant was sent to Dr. James Hickey and his colleagues at Miami University in Ohio for genetic analysis. Their data are being incorporated into a plan to reintroduce the running buffalo clover into historical sites in Missouri.

Running buffalo clover has been in protective cultivation at the Garden for three years, through our affiliation with the Center for Plant Conservation. Last summer, 14 mature plants were placed in three sites by the Department of Conservation to test a reintroduction program (see the *Bulletin*, November/December 1990).

The Garden is continuing to work with a "Recovery Team" for the reintroduction of endangered plants to the wild. The project includes people from the Missouri Botanical Garden, the Missouri Department of Conservation, the U. S. Fish and Wildlife Service, and the U. S. Forest Service. It is an exciting venture, with all these groups working together to provide the resources and expertise that are unique to each organization.

In addition to propagating endangered plants in our living collection, the Garden is also working with researchers and wildlife managers to incorporate genetic data into the reintroduction and management plan. It is our hope to remove running buffalo clover from the Endangered Species List in the future.

PROFILE

RICHARD BENKOF

Lucile McCook

Horticultural Taxonomist

"I love telling people about plants," Lucile McCook says with enthusiasm. "My work here at the Garden is a wonderful opportunity to combine botany, horticulture and education."

Lucile manages the Plant Records Department, which keeps track of all the plants on the grounds and in the greenhouses. She prepares signs and interpretive exhibits and is responsible for bringing native Missouri plants into propagation at the Garden. She also manages the Garden's collection of endangered plants for the Center for Plant Conservation, which includes non-destructive collecting of plants in the region, growing threatened species here at the Garden, and cooperative work with the Department of Conservation and U.S. Fish and Wildlife Service.

Lucile joined the staff in February after completing a postdoctoral fellowship at the Smithsonian's Museum of Natural History, doing research on orchids. She earned her Ph.D. in systematic botany from Cornell in 1989, working at the Liberty Hyde Bailey Hortorium. She received her undergraduate degree in horticulture and worked as a grower at the Louisiana Nature and Science Center in New Orleans. "I'm floored by the richness of Missouri's flora," Lucile says enthusiastically. "It's incredibly rich and interesting."

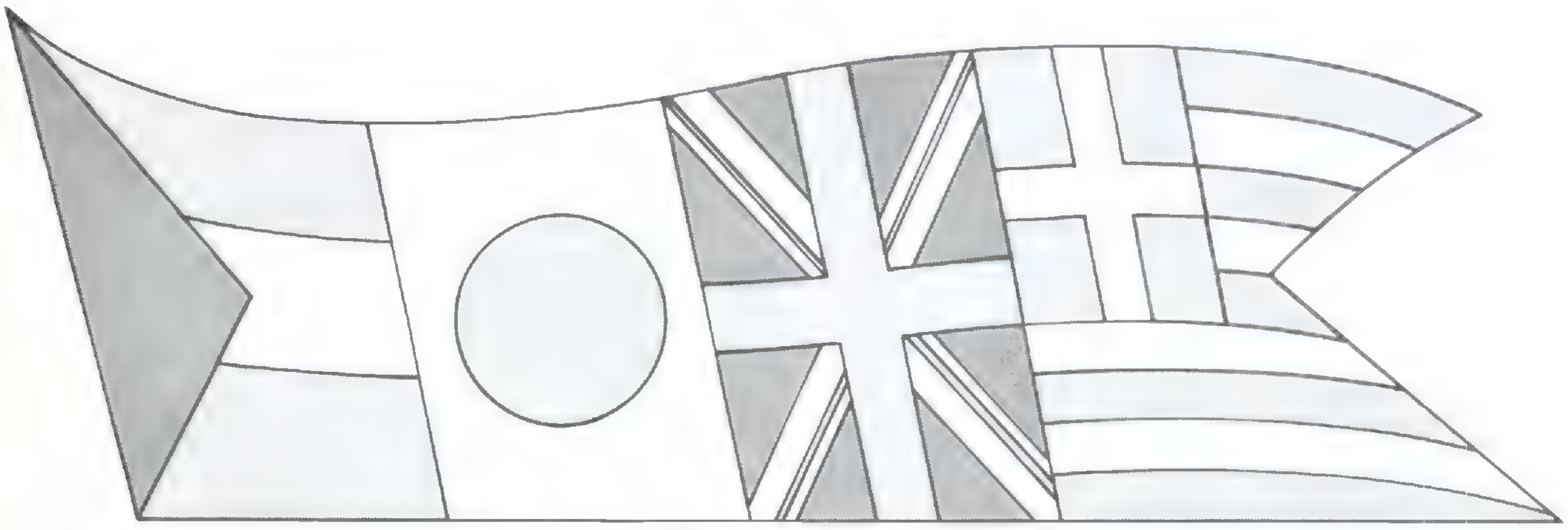
"Coming to the Garden is a tremendous opportunity," she continues. "It's a privilege to work with the horticulture staff — they're great professionals, extraordinarily knowledgeable. And the Garden itself is a visionary institution, not afraid to be first to try new things, to use imagination to stretch our resources. I'm delighted to be here, and I'm excited about helping to educate people about our plants."

FIRST WEEKEND: AUGUST 2-4
Japanese Festival—"Living Arts"

The 17th Annual Japanese Festival celebrates Japan's strong cultural heritage of passing art forms from generation to generation. Performers and artisans will share a broad spectrum of the arts, including bonsai demonstrations by a master instructor, martial arts and cooking demonstrations, the Candyman from Epcot Center, a kimono fashion show, and the return of the popular San Francisco Taiko Drummers. Four artists will present "Daido Gei" Japanese street festival performances. There will be morning tours of the Japanese Garden, and the popular candlelight walks will be held in the evening. There will be a $1 fee for performances in the auditorium.

SECOND WEEKEND: AUGUST 9-11
Greek Festival—"A Celebration of Life"

Friday and Saturday evenings Spoehrer Plaza will be transformed into a Greek taverna, where food, music and dance take center stage. The Shoenberg Temperate House will be open and lighted, its Mediterranean courtyard filled with the music of the bouzouki, a traditional Greek instrument. On Saturday and Sunday visit the "Plaka," a marketplace featuring the arts and crafts of Greece. Throughout the weekend the festival will host performances by outstanding Greek entertainers: the Levendia Folkdance Troupe from Tampa, Florida, and the Grecian Keys musical ensemble from Youngstown, Ohio. There will be traditional Greek fashion displays, art exhibits, storytelling, travelogues, cooking demonstrations and more. Some children's workshops will require advance reservations.



Festival *of* Festivals

It's new, it's exciting, it's a month-long gala in August at the Garden! Make your plans now to celebrate the cultures of four different countries, Japan, Greece, England, and the Caribbean, on four different weekends. There will be something for everyone, with music, arts and crafts, food, entertainment, exhibits and more.

Each weekend's celebration begins on Friday, 6 to 10 p.m., continues Saturday 11 a.m. to 10 p.m., and concludes on Sunday, 11 a.m. to 8 p.m. Regular Garden admission will be charged. The Garden will open at 9 a.m. daily as usual.

Support for the Festival of Festivals has been assisted by a challenge grant from the Fannie May/Coleman Foundation. Other sponsors will be announced.

THIRD WEEKEND: AUGUST 16-18
English Festival: "Henry Shaw's England"

The weekend opens Friday and Saturday evenings with candlelight walks through the English Woodland Garden, featuring strolling musicians and actors in period costume. The festival will feature performances by Peter Bellamy, visiting from Manchester, England, who presents the poetry of Rudyard Kipling accompanied by music. Other performers will be the St. Louis English Country Dance Society, Morris dancers, films, storytelling, and demonstrations of English crafts including lacemaking, weaving, musical instrument makers, barrel makers and more.

FOURTH WEEKEND: AUGUST 23-25
Caribbean Festival: "Colors of the Caribbean"

Take a fanciful trip to the U.S. Virgin Islands and the Bahamas. Experience the excitement of colorful Caribbean parade groups, steel drum bands, folk dancers, a stilt walker, straw craft demonstrations, and more surprises.

Festival Hotline opens Monday, July 29.
Call 577-5125 for schedules and information.

Missouri Botanical Garden

CALENDAR OF EVENTS

July-August 1991

July Is Children's Month at the Garden

The Garden teams up with KMOV-TV Channel 4 and their "For Kids' Sake" partners, Popeyes and Dierbergs, to present events especially for children. The smiling sun face marks these events.

All Aboard the MoBot Express!

Throughout July the Garden will have a special tram especially for kids. Whenever a children's event is held, the Express will be running. Be sure to catch it!

WALKING TOURS Every Tuesday, Saturday and Sunday 1:00 p.m.

Join the Garden Guides for a tour of the grounds, featuring the art, architecture, history and horticulture of the Garden. Meet at the ticket counter in the Ridgway Center. Free with regular Garden admission.

L. A. KELLY

JULY 4 / "An Old Fashioned 4th of July"

Noon to 7 p.m., Tower Grove Park and Garden grounds. Bring family and friends for a celebration with bands, food, carriage rides, barbershop quartet, pony rides, and more fun activities for all ages! Picnic in Tower Grove Park and the Garden; free admission all day long.

JULY

1 MONDAY

"Lillies of the Garden" Exhibit

9 a.m. to 8 p.m., daily through July 28, Ridgway Center. St. Louis photographer Chuck Dresner displays color pictures of water lilies taken at the Garden, which were featured in *Audubon* Magazine. Regular Garden admission.

3 WEDNESDAY

Children's Film Festival: "Peter Pan"

11 a.m. and 1:30 p.m., Shoenberg Auditorium. Doors open 30 minutes before show time. Tickets go on sale June 17 at the Ticket Counter, or will be sold at the door. $1 members, $2 non-members.

7 SUNDAY

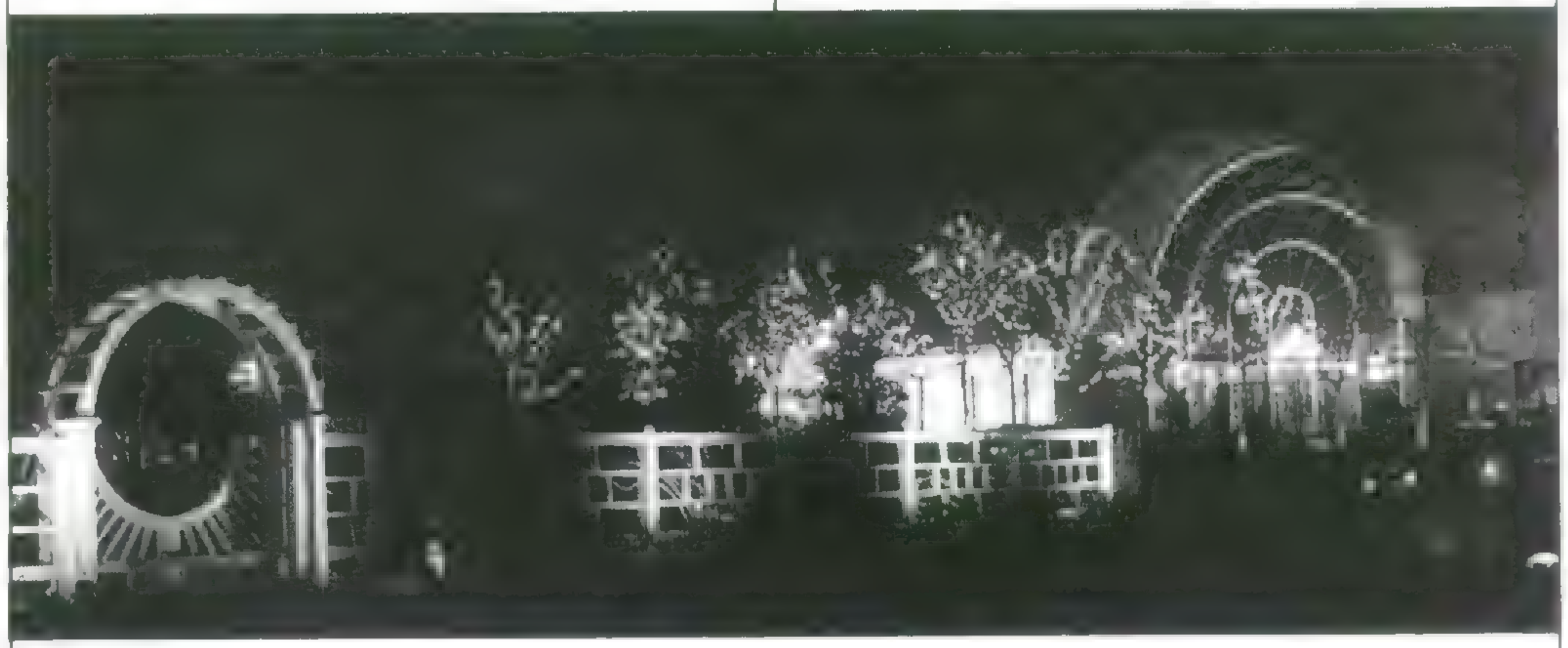
Kids in Konzert

11 a.m. to 4 p.m., grounds. A variety of music, song, and dance performed by children. Regular Garden admission.

10 WEDNESDAY

Children's Film Festival: "The Little Mermaid"

See July 3 for details.



PATRICK WATSON

JULY 11 / MEMBERS' DAY Moonlight Stroll

9 to 11 p.m., grounds. Come enjoy a beautiful summer night complete with a full moon. Stroll the lighted grounds—but bring a flashlight for easy rambling. The Climatron will be open; cash bars available. For members only.

15 MONDAY

Folklore & Legends

9 a.m. to 4 p.m., Shoenberg A
rium and Ridgway Center. Stor
ling featuring ethnic folk tales b
Jackie-Torrence, Bobby Norfol
the St. Louis Gateway Storyte
Dolls and artifacts from arounc
world are on display in Monsar
Hall. Events in the auditorium
$1 per person. Tickets go on s
June 17 at the Ticket Counter.
Events outside the auditorium
free with regular Garden admi

17 WEDNESDA

Children's Film Festival: "Dr. Doolittle"

See July 3 for details.

18 THURSDAY

Puppets Galore

11 am. to 4 p.m., Ridgway Ce
and grounds. Puppet shows
throughout the day by Kramer
Marionettes, Paul Mesner Pu
and Hystopolis. Lifesize costu
puppets will roam the grounds
puppetry workshops will be h
Call 577-5125 for more inform
and workshop registration. Re
Garden admission, plus $1 pe
son for auditorium performanc
and $5 per person for worksh
Tickets for auditorium performances go on sale June 17 at t
Ticket Counter.

20 SATURDAY

Parenting Fair

9 a.m. to 5 p.m., Ridgway Ce
Eighth annual event showcase
exhibits, activities and semina
all ages, presented by KMOX
Radio, *St. Louis Post-Dispatch*
KSD-TV to benefit Kids In th
dle. Sponsored by Chex Cere
Monsanto, Pet, Inc., and Proc
Gamble. Storytelling, clowns
toon characters, musicians, fu
learning activities. Admission
to noon: $2 adults, $1 childre
under 12. Admission betweer
and 5 p.m.: $3 adults, $1.50 c
under 12.

SUNDAY

ociety Rhizome Sale

n., Ridgway Center. The
er St. Louis Iris Society holds
nual sale of surplus rhizomes
he Garden's displays; all pro-
benefit the Garden. Come
as supplies sell out quickly!

RICHARD BENKOF

24 WEDNESDAY

Henry Shaw's Birthday Celebration/"For Kids' Sake" Day

11 a.m. to 4 p.m., Ridgway Center and grounds. Celebrate the 191st birthday of the Garden's founder, Henry Shaw, with magic shows, "Double Dutch" jump rope demonstrations, a special "Garden Rap" by St. Louis Magnet School students, and more surprises. From 10 a.m. to 2 p.m. Tower Grove House Auxiliary will sell cookies, lemonade and iced tea on the lawn of Shaw's country home, to benefit Tower Grove House. Regular Garden admission.

Children's Film Festival: "Milo & Otis"

See July 3 for details.

31 WEDNESDAY

Children's Film Festival: "Ducktales: The Movie"

See July 3 for details.

AUGUST

"Festival of Festivals"

First four weekends. A joyous celebration of the cultures of four different countries with music, food, entertainment and more. Regular Garden admission. Call Festival Hotline at 577-5125 starting Monday, July 29 for schedules and information. See page 11 for more details.

FRIDAY-SUNDAY

ese Festival: "Living Arts"

p.m. Friday; 11 a.m. to 10
aturday; 11 a.m. to 8 p.m.
y; Ridgway Center and
ds. See page 11 for details.
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n Friday and Saturday
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9-11 FRIDAY-SUNDAY

Greek Festival: "A Celebration of Life"

6 to 10 p.m. Friday; 11 a.m. to 10 p.m. Saturday; 11 a.m. to 8 p.m. Sunday; Ridgway Center and grounds. See page 11 for details. Garden grounds and Temperate House will be lighted for strolling Friday and Saturday evenings.

16-18 FRIDAY-SUNDAY

English Festival: "Henry Shaw's England"

6 to 10 p.m. Friday; 11 a.m. to 10 p.m. Saturday; 11 a.m. to 8 p.m. Sunday; Ridgway Center and grounds. See page 11 for details. Candlelight walks in the English Woodland Garden, Friday and Saturday evenings.

23-25 FRIDAY-SUNDAY

Caribbean Festival "Colors of the Caribbean"

6 to 10 p.m. Friday; 11 a.m. to 10 p.m. Saturday; 11 a.m. to 8 p.m. Sunday; Ridgway Center and grounds. See page 11 for details.

THURSDAY

cape Photography Lecture

p.m., Shoenberg Audito-
ohn Smithers, award-winning
aker and authority on wild-
and landscape photography,
ses his work. $18 members,
n-members. Limited seating;
e registration requested. Call
3512.

3-4 SATURDAY & SUNDAY

Landscape Photography Workshop

6:30 to 10:30 a.m., Shaw Arboretum, 5 to 7:30 p.m., MBG; both days. Join John Smithers for a comprehensive workshop in wildflower and landscape photography. $150 members, $175 non-members, includes lecture on August 1. Advance registration required, reservations are limited. Call the Arboretum at 1-742-3512 for more information.

31 SATURDAY

Henry Shaw Cactus Society Show

9 a.m. to 8 p.m. through Labor Day; 9 a.m. to 5 p.m. through September 8. Orthwein Floral Hall. A magnificent display of rare, unusual, and interesting plants. Regular Garden admission.

PATRICK WATSON

ARDEN WALKERS BREAKFAST
ery Wednesday and Saturday, 7 to 10:30 a.m.

The Garden opens early on Wednesday and Saturday morn-
gs. The mileage of various paths around the grounds are
ailable at the ticket counter. The Gardenview Restaurant offers
"heart healthy" breakfast buffet of cereals, fruit, juice, and
ogurt. The greenhouses do not open until regular opening hours
9:00 a.m. Admission is free before noon every Wednesday and
aturday. Call 577-5125 for information. Sponsored by the
merican Heart Association.

AUGUST 10 / MEMBERS' DAY
Early Morning Stroll

5:10 (sunrise) to 9 a.m. Watch the sun come up and savor the early morning peace of the Garden in summertime. Free coffee will be provided. For members only.

From the Membership Office

MEMBERS' TRAVEL PROGRAM

Madagascar: Spiny Desert and Rain Forest

October 18 to November 1, 1991

The Garden's tour of Madagascar takes you to a spectacular island in the Indian Ocean that contains one of the world's richest and most threatened tropical floras. Nearly three-quarters of this island's 10,000 plant species are found nowhere else in the world, including almost 1,000 orchids and a tremendous range of beautiful and bizarre succulents. The Garden is assisting the Malagasy people and the international community in a last-ditch effort to save one of the world's great wonders, the rain forest of the Masoala peninsula. Join Garden botanists Dr. Porter P. Lowry II and Dr. George Schatz in a two-week visit of some of Madagascar's most spectacular areas. Learn what the Garden is doing to help science and conservation in this enchanting faraway land. A partial itinerary includes:

■ Optional two-day pre-tour in Paris, featuring a day's outing to the celebrated "Gardens of Paris," including Versailles and Monet's Giverny.

■ In Madagascar, travel to Ft. Dauphin at the extreme southern tip of the island, a charming town that has changed little since it was settled in the 1600s.

■ Drive to Berenty Reserve, traversing one of the most remarkable vegetation transitions in the world. Travel from rain forest to spiny desert, and spend the night in bungalows on the edge of the forest.

■ Visit the Special Reserve of Perinet, observing chameleons, lemurs, and over 100 species of birds.

■ Fly to Maroansetra, headquarters of the Garden's conservation project on the nearby Masoala Peninsula, which contains some of the country's largest remaining tracts of undisturbed rain forest.

■ Picnic on the island of Nosy Mangabe in the Bay of Antongil, a reserve created to protect perhaps the strangest of Madagascar's 30 species of lemurs, the nocturnal "aye aye."

■ In capital city of Antanarivo, visit the Museum of Art and Archaeology, with an afternoon at Tzimbazaza Botanical Garden and Zoological Park.

Call Brenda Banjak at 577-9517 for registration information for this fabulous adventure.

Lord & Taylor Galleria Opening Benefits the Garden

Come to a gala reception to preview the new Lord & Taylor store at the St. Louis Galleria on Wednesday, July 24, 1991, black tie. The party begins at 7:00 p.m. Return the form below or call 577-9500.

Henry Shaw Committee Recognized

The Garden's Board of Trustees, meeting on April 17, received a report from John K. Wallace, Jr., chairman of the Henry Shaw Committee, on the results of the Committee's 1990 campaign. Members of the Committee were recognized for their hard work and dedication to this year's successful fund raising effort. In addition to Mr. Wallace, the 1990 Committee included Patrick Ackerman, Frederick Atwood, Clarence Barksdale, Stephen Brauer, Jules Campbell, Samuel Hayes, Scott Jones, David Kemper, Douglas MacCarthy, James Mauze, Nora Stern, Walter Stern, Andrew Taylor, John Thiebauth, Robert Tschudy, O. Sage Wightman III, Kay Wren, and Hal Wuertenbaecher, Jr.

The Henry Shaw Committee plays an invaluable role in acquiring financial support for the Garden's programs and services. These funds provide necessary revenue for Garden operations. Funds are also made available from tax support through the Botanical Garden Subdistrict of the Metropolitan Zoological Park and Museum District, membership support, admission fees, and grants from foundations and corporations.

Reservation Form—"A Salute to the Missouri Botanical Garden"

Tickets are $100 per person. Payment may be made by VISA, MasterCard by calling 577-9500, or by check. Make check payable to: Missouri Botanical Garden.

RESERVATIONS ARE LIMITED. A confirmation will be mailed in June.

Name(s)____________________

Address____________________

City__________ State__________ Zip__________

Number of tickets $100 each____________________

Total payment____________________

I cannot attend, but will make a contribution of:____________________

$75 of each $100 ticket is tax deductible.
Additional information: Brenda Banjak, Membership Coordinator, 577-9517

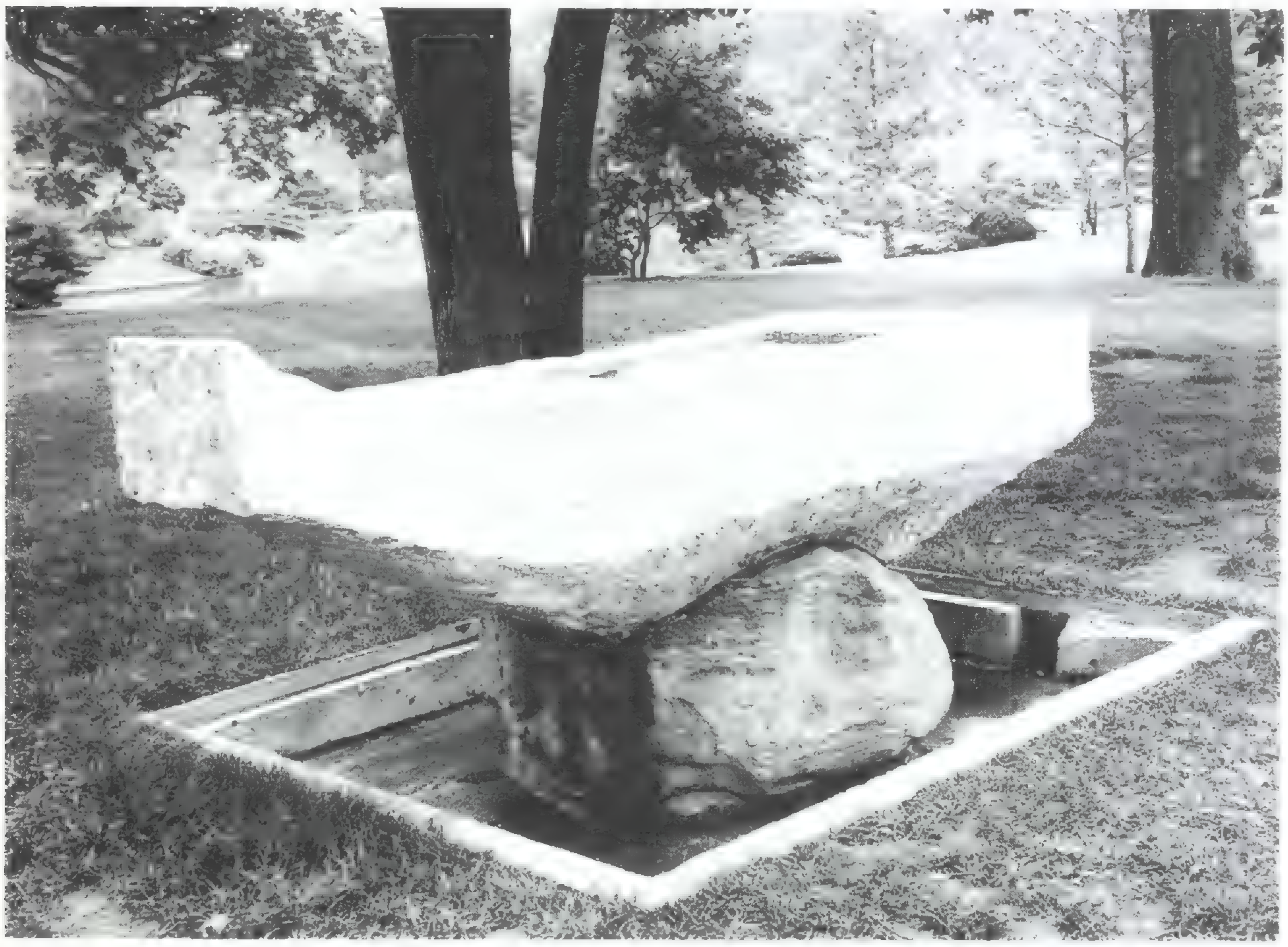
Mail to: "Salute to the Garden, Missouri Botanical Garden,
P.O. Box 299, St. Louis, MO 63166-0299.

Volunteer Service Recognition

Charlotte Mandel, honored for 30 years of service to the Garden.

RICHARD BENKOF

At a ceremony on April 24, 1991, the Garden paid tribute to the volunteers who have completed milestones of service to the Garden. Honored for 30 years as a Garden volunteer was Charlotte Mandel (at left), who was unable to attend the award ceremony. Pictured above at the ceremony (front row, left to right): Carolyn Vassallo, 10 years; Catherine Schumann, 20 years; Rena Gross, Mary Ann Pelot, and Ethel Herr, all 10 years. (Back row, left to right): Elmer Wiltsch, Joy Last, Betty Nellums, and Terry Conway, all 10 years; Norma Hill, 20 years; and Marshall Magner, Doris Johnston, Ruth Jonas, Alfred Loftus, and Nancy Weith, all 10 years. Not pictured: 10-year honorees Albert Baeyen, Charlotte Baeyen, Joanna Turner and Jean Zinsmeyer.



RICHARD BENKOF

JAPANESE BOAT BASIN—Visitors to the Japanese Garden may have wondered about the striking new installation on the north shore of the lake. The handsome sculptured stone basin, designed by the late Koichi Kawana, is a gift of the Jones-Weakley family and friends in memory of Edward D. Weakley and A. Clifford Jones, Jr. The boat basin, sculptured of granite, is unusual in this country and remarkable for its size: seven feet in length, weighing four tons on a three-ton base. When complete, the setting will be enhanced by a bamboo and wood water spout, Watanga ebony boulders, Mexican Black Beach pebbles and Beaver Creek border stones. Boat basins symbolize the god of good fortune.

Sturtevant Papers Added to the Archives

The Garden recently purchased additional personal papers of Edward Lewis Sturtevant (1842-1898), including more than 200 letters, 63 documents, 6 photographs, and a small trunk. These items date from the period of the 1850s through the 1890s and provide interesting information on Dr. Sturtevant's life, the gift of his library to the Garden, and the Civil War period. The Garden Archives already had a number of Dr. Sturtevant's botanical notes and correspondence. Dr. Sturtevant was a benefactor of the Garden, having given his Prelinnaean Library to the Garden in 1892. Prelinnaean refers to works published before 1753, the publication date of Carl Linneaus' *Species Plantarum*, the work that signaled the beginning of modern botanical nomenclature. In a 1892 letter to William Trelease, the Garden's director, he wrote, "For some time it has seemed to me that my library of early botanical literature would be more used at the Missouri Botanical than elsewhere as your institution will become interested in the history of plants and their development."

The new Sturtevant materials were purchased through the generosity of Garden members who contribute to the library's special collections fund, and they are available to researchers.

—*Constance P. Wolf, Garden Librarian*

CLIFF WILLIS

GRANT SUPPORTS ENERGY EFFICIENCY—Rex Knoles (right), manager of car control for Union Pacific Railroad, presented a check for $30,000 to Peter Raven in June. A $60,000 grant from Union Pacific Foundation, payable in two installments, supplements the energy efficiency improvements to the Ridgway Center (see the Bulletin, *March-April 1991) supported by a low-interest loan from the Missouri Department of Natural Resources. "The Union Pacific grant will allow us to realize substantial savings on our energy costs even sooner than anticipated," Dr. Raven said. "This means we can devote those resources to serving growing numbers of visitors. We are very grateful to Union Pacific for their generous support."*

Botanical Garden Subdistrict Elects New Officers

At the annual meeting of the Commission of the Botanical Garden Subdistrict of the Metropolitan Zoological Park and Museum District of the City of St. Louis and St. Louis County held at the Garden on May 22, 1991, the commission elected new officers for 1991-92. They are Sandra H. Bennett, chairman; Theresa Loveless, vice chairman; Homer E. Sayad, treasurer; and Robert H. Orchard, secretary.

The Subdistrict is comprised of ten members, five each from St. Louis City and County. The commissioners serve as the public body responsible for receiving and disbursing funds acquired through the property tax support approved by voters in 1983.

THIS SUMMER AT SHAW ARBORETUM

New Wetlands Area Is Created

An exciting new natural display is being developed at Shaw Arboretum. Construction began in May for a five acre pond marsh wetland area on the flood plain of Brush Creek near Gray Summit Road on the east side of the Arboretum. A second three acre area will be constructed in the spring of 1992.

Wetlands areas, which include marshes, fens bogs, sedge meadows, ox bow sloughs, potholes, and swamps, have long been considered undesirable wastelands. The rapid loss of natural wetlands areas to development in recent years has brought overdue attention to their importance in the ecosystem. Wetlands provide a natural cleansing system for waterways and vital habitats for wildlife and plants.

The Arboretum's new wetlands environment will contain a diverse display of native Missouri aquatic plants, and will provide a habitat for muskrats, mink, salamanders, newts, chorus frogs, spring peepers, a variety of turtles and snakes, and many species of birds. Educational courses and interpretive materials will be developed to increase understanding and appreciation of these dynamic aquatic systems.

A trail leading to the site begins at the northeast corner of the experimental prairie and is visible from the Trail House Loop Road. Eventually a board walk and viewing platform will be constructed to provide visitors a closer look at the plant and animal life in the wetlands area.

The wetlands project is supported by a $4,000 grant from the U.S. Fish and Wildlife Service, technical assistance from the Franklin County Branch of the U.S. Soil Conservation Service, and generous gifts from Mr. and Mrs. August Homeyer and another environmentally concerned family that prefers to remain anonymous. The staff of the Arboretum is grateful for their support and for the opportunity to acquaint visitors with the beauty and importance of wetlands areas.

Garden Explorer Patches Awarded

One hundred and fifty Girl Scouts from River Bluffs Girl Scout Council received patches in a ceremony in the Japanese Garden on May 18, 1991. The ceremony celebrated the Garden Explorer Patch Program, which has been developed by Garden and Girl Scout staff and volunteers over the past three years. The Scouts receiving the patch had completed the pilot program between April 1990 and May 1991. They were the first to earn the patch.

The *Garden Explorer* is a folder filled with educational activities based on different areas of the Garden. Published in 1989, it was written by Nancy D'Arcy, a St. Louis Public School teacher working at the Garden. The project was made possible by a generous gift in honor of Barbara Z. Cook, a Garden Guide.

The Scouts earned patches based on two of the activity sheets, which they completed while visiting the Garden. The patches are called "Garden Explorer", based on the history and purpose of the Missouri Botanical Garden, and "Seiwa-en: The Japanese Garden". More patches are planned.

The Garden Explorer Patch Program was coordinated by Mary Griggs and Catherine Robinson of the River Bluffs Girl Scout Council and Pamela Pirio of the Stupp Teacher Resource Center at the Garden. The program is designed for children of all ages, not just for Scouts. Educators and youth group leaders who would like more information may call Pam Pirio at 577-9501.

IMS Awards Garden $75,000

The Institute of Museum Services (IMS), a federal agency that offers general operating support to the nation's museums, has awarded the Garden $75,000 to assist in basic services and programs. The grant was one of 432 awarded this year through a nationwide competition that evaluates all aspects of the museums' operation. Applications were received from 1,390 museums of all types from throughout the country.

The Institute of Museum Services provides the only federal source of general operating support for the nation's museums. It was established in 1976 by Congress as an independent federal agency to assist museums in their efforts to preserve the nation's cultural, historic, and scientific heritage.

Trustee Profile

Rev. Earl E. Nance, Jr.

The Reverend Earl E. Nance, Jr. joined the Garden's Board of Trustees as an ex-officio member upon his election as president of the St. Louis Board of Education this spring. Nance, a native St. Louisan, has been co-pastor of the Greater Mount Carmel Baptist Church since 1979. Appointed to the School Board in 1987 to fill an unexpired term, he then ran successfully for the position in 1989 at which time he began serving a six-year term.

Prior to accepting his post as co-pastor, Nance taught elementary school in the St. Louis Public Schools.

Dr. Raven noted that Reverend Nance's breadth of experience and involvement in the St. Louis region offers much to the Garden "At a time when we are diligently undertaking new programs and activities to expose the Garden to a much broader audience, Reverend Nance's insights and leadership in St. Louis will serve as a valuable asset in assisting us in these important endeavors," said Dr. Raven.

"The Garden is a wonderful institution and the St. Louis Public Schools have benefited over the years from the partnership formed with the Garden. Its commitment to the improvement of science education is laudable and I anticipate many future opportunities to strengthen the ties with the Missouri Botanical Garden during my tenure as a Trustee," commented Nance.

Reverend Nance has maintained a serious commitment to create a strong alliance between the city schools and the St. Louis community. He has also served on boards and commissions on the local and state level including an appointment to the 22nd Judicial Commission, the United States Bicentennial Constitution Commission of Missouri, and the Community Advisory Committee of the St. Louis Board of Education.

Nance and his wife, Viola, and their daughter live in St. Louis City.

IN MEMORIAM—DAVID BARON: Friends of the Garden were saddened by the death of David Baron on April 11, 1991. Mr. Baron, a native St. Louisan, had practiced law in St. Louis since 1916. In 1979 he presented to the Garden the beautiful bronze Mother and Child, *by Marcel Rau, that stands near the path on the west side of the Knolls. In addition to his generosity to the Garden, Mr. Baron was a leader in the Jewish community, a life member of the Jewish Federation and a past president of the Jewish Community Centers Association. He will be deeply missed.*

CLIFF WILLIS

"FOUR SEASONS" DEDICATED—On April 19, 1991, the Garden dedicated "Four Seasons," a sculpture of white Georgia marble by St. Louis artist Marie Taylor. The sculpture, four interconnected figures depicting the seasons, is a gift of Mr. and Mrs. Clarkson Carpenter III. It has been placed in the Hosta Garden. Pictured at the dedication ceremony are (left to right): Marie Taylor, Peter Raven, Mrs. Clarkson Carpenter, Clarkson Carpenter, and Mrs. Thomas W. Shields, donor of the Hosta Garden.

Oscar Arias Sanchez (below, right), past president of Costa Rica and a winner of the Nobel Peace Prize, visited the Garden on May 16. He toured the herbarium with assistant director Dr. Marshall Crosby (left) and discussed the Garden's Flora of Costa Rica project.

WILLIAM GREENBLATT

RICHARD BENKOF

The director of the National Park Service and his regional directors and other support staff visited the Garden on May 9. They were introduced to the Flora of North America project and the Center for Plant Conservation's programs, followed by a tour of the Garden. Front row, left to right: Jill York O'Bright; Nancy Morin, MBG; L. Lorraine Mintzmyer; Sean Bursell; Gerald Patton; Geraldine Smith; Robert Baker; Charles Odegaard; John Reynolds; Peggy Olwell, MBG. Middle row, left to right: Marshall R. Crosby, MBG; David Wright; Robert Stanton; John Moorehead; Jerry Rogers; James Ridenour; Donald Castleberry; James Coleman; Denis Galvin; Edward David. Back row, left to right: Boyd Evison; Jerry Schober; Eugene Hester; Stanley Albright; John Cook; Gary Easton; Herbert Cables, Jr.

On May 3, 1991, the Center for Plant Conservation Trustees held their first board meeting here since the Center moved to St. Louis early this year. Pictured are (left to right) Donald A. Falk, director of CPC; Grace Padberg, administrative assistant; Michael O'Neal, manager, information systems; Dr. Robert E. Bruenig, Trustee; Dr. Peter H. Raven, director of the Garden; Polly Pierce, Trustee; Richard D. Phippen, Trustee; Janet M. Poor, Trustee; Henry R. Norweb, Jr., Trustee; William A. Truslow, Trustee; Marilee Poulter, senior administrative assistant; William Robertson IV, Trustee; Peggy Olwell, conservation programs manager; Dr. William Hugh Bollinger, Trustee; Dr. Robert E. Cook, Trustee; Dorothy Wallace, Trustee; and Jonathan Shaw, Trustee.

Graduate Students in the News

NSF, OTS and Garden Club Awards

Students working toward advanced degrees at the Garden have received numerous awards and honors recently.

Jennifer Talbot has been awarded a National Science Foundation Graduate Fellowship, which will pay her stipend and tuition for three years and will also include some travel funds. Jennifer has also won a place on the Organization for Tropical Studies (OTS) course ''Tropical Biology: An Ecological Approach'' in Costa Rica this summer.

Carolina Israel has been selected for the OTS course ''Tropical Managed Ecosystems'', also in Costa Rica this summer. Ricardo Rueda has just returned from the winter OTS course. Oliver Phillips has been awarded a $5,000 grant from the Garden Club of America for his fieldwork in Peru.

All of these awards are highly competitive, and the Garden congratulates the students on their honors.

National Geographic Article Includes Fay

The work of J. Michael Fay, a Ph.D. candidate at Washington University, was extensively described in the cover story ''Elephants'' in the May 1991 issue of *National Geographic* magazine. Mike's work in the Central African Republic concerns the ecology and feeding behavior of lowland gorillas, and in the process of studying them he has become an expert on the habits of elephants as well. An anthropologist by training, Mike is extremely knowledgeable about the plants eaten by the animals he studies, and the effects of animals' feeding habits on the ecosystem. He is currently completing his doctoral dissertation, for which Dr. Raven is his advisor.

Falk Is Elected to AAAS

Don Falk, director of the Center for Plant Conservation, recently was elected a fellow of the American Association for the Advancement of Science (AAAS). Founded in 1848, AAAS is a private, independent organization that facilitates cooperation among scientists, educators, and scientific organizations. It has more than 134,000 members and 300 affiliated organizations. Since 1900 AAAS has published the weekly journal *Science*, which was established by Thomas Edison in 1880.

From the Garden Gate Shop

New MBG Tie

The Shop is featuring a wonderful gift item, a handsome new Missouri Botanical Garden men's tie. Woven of a silk polyester blend in an attractive herringbone pattern, the tie is a deep blue accented with thin stripes of gold and teal or gold and red, accented with the Garden logo. The ties are made exclusively for the Garden, priced at $22.50.

Gardening Books Galore

The Gate Shop has the finest selection of gardening books in the St. Louis area. Now that the height of the summer growing season is here, come in for a fresh crop of tips and ideas. Some new titles:

Garden Smarts: A Bounty of Tips from America's Best Gardeners, by Shelley Goldbloom, The Globe Pequot Press, 320 pages, $12.95 paperback. A compulsively readable book of nearly 1,200 invaluable gardening tips, harvested by the author from 200 amateur and professional gardeners with bright green thumbs. Shelley Goldbloom is a freelance gardening writer and a producer-host for a National Public Radio member station.

You Call That a Farm? Raising Otters, Leeches, Alligators, Weeds, and Other Unusual Things, by Sam and Beryl Epstein, Farrar, Straus & Giroux, 64 pages, $12.95. Engagingly written text with photographs takes children on a tour of unusual farms to meet farmers who dared to try something new.

Beneficial Insects for Sale

To assist gardeners who want to reduce the use of chemical pesticides, the Shop is offering beneficial insects that prey on garden pests. Available are ladybugs, 1500 for $5.95; green lacewings, 1000 eggs for $18.95; and trichogramma eggs, 1000 for $18.95.

RICHARD BENKOF

GRANT AWARDED—Donald H. Streett, chairman of the Board of Directors of the St. Louis Community Foundation (right), presents a check for $5,000 to O. Sage Wightman III, president of the Board of Trustees. The funds support the recently completed Community Perceptions Study conducted by the Garden. The St. Louis Community Foundation supports local not-for-profit organizations in their efforts to improve the quality of life for all citizens of the St. Louis metropolitan area.

RICHARD BENKOF

DISTINGUISHED VISITORS—Dr. Neil R. Chalmers, director of The Natural History Museum, London, is pictured (above, left) at a dinner given in his honor May 23, 1991. Dr. Chalmers visited the Garden to discuss current and proposed collaborative research projects. Shown with Dr. Chalmers is O. Sage Wightman III, president of the Board of Trustees. Above right: Also attending the dinner May 23 were (left to right) Dr. William Tai, coordinator of the Flora of China project at the Garden; Dr. Sun Hong-lie, Dr. Zhang Xin-shi, and An Jian-ji, all of the Academia Sinica, Beijing.

IN MEMORIAM

Walter Rodenroth

Staff and friends of the Garden were saddened by the death November 20, 1990, of Walter Rodenroth, a long-time volunteer in the herbarium. Mr. Rodenroth, who was a pharmacist in South St. Louis for over 50 years before his retirement, began volunteering at the Garden in January, 1975.

In the herbarium, Walter worked daily for over ten years at the enormous job of sorting mountains of plant specimens by genus and species. He was extremely knowledgeable about plants and their medicinal uses, and he enjoyed sharing his knowledge with colleagues. His kindness and good nature will be deeply missed.

Raven Awarded Gregory Medal

The Bishop Museum, the State Museum of Natural and Cultural History in Honolulu, Hawaii, awarded the Herbert E. Gregory Medal to Dr. Peter H. Raven on May 27, 1991. The Medal is given approximately every four years, on the occasion of the Pacific Science Congress, and recognizes Dr. Gregory's role as founder of the Pacific Science Association.

Candidates for the award are selected on an international basis for distinguished research contributions in anthropology, botany, geology, or zoology of the Pacific.

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To avoid missing any of your membership mailings, you *must* give us your new address at least three weeks *before* you move. Please enclose the mailing label on the back cover of this *Bulletin*, and mail to: Membership Office, Missouri Botanical Garden, P.O. Box 299, St. Louis, MO 63166.

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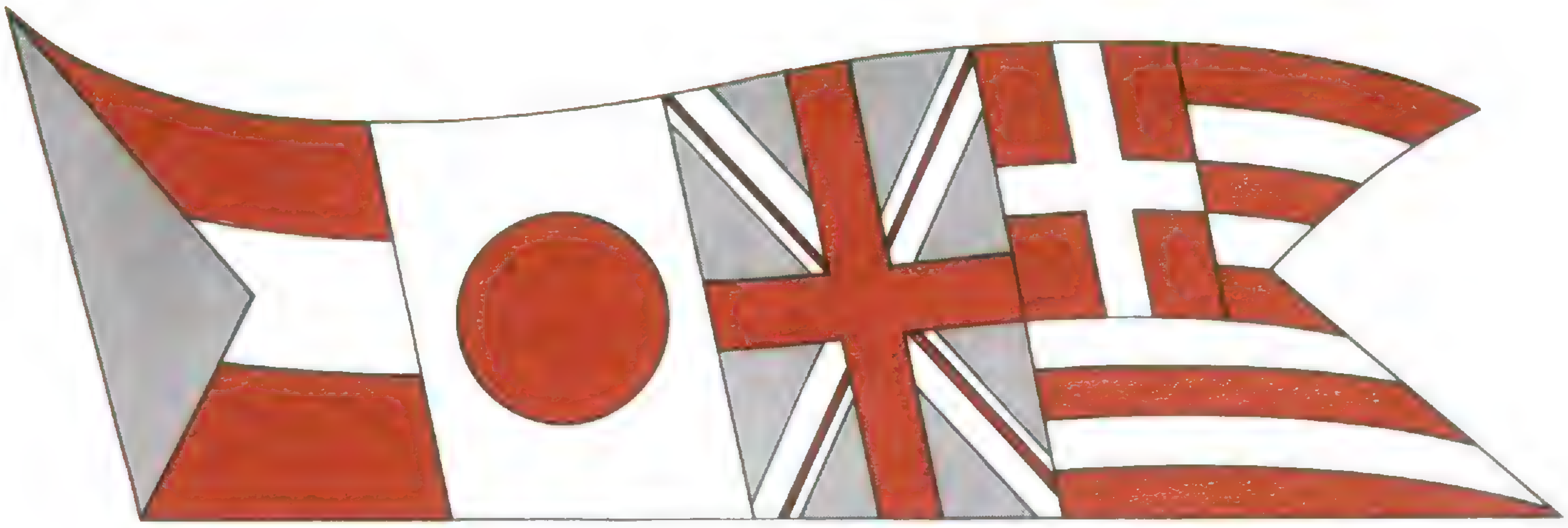

Festival *of* Festivals

August 1991

It's new, it's exciting, it's a month-long gala in August at the Garden! Make your plans now to celebrate the cultures of four different countries, Japan, Greece, England, and the Caribbean, on four different weekends. There will be something for everyone, with music, arts and crafts, food, entertainment, exhibits and more.

Each weekend's celebration begins on Friday, 6 to 10 p.m., continues Saturday 11 a.m. to 10 p.m., and concludes on Sunday, 11 a.m. to 8 p.m. Regular Garden admission will be charged. The Garden will open at 9 a.m. daily as usual. A Festival Hotline opens Monday, July 29. Call 577-5125 for schedules and information. See page 11 for details.

Support for the Festival of Festivals has been assisted by a challenge grant from the Fannie May/Coleman Foundation. Other sponsors will be announced.

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LUME LXXIX
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On the cover: The drum bridge, *Taikobashi*, in the Japanese Garden.
— Photo by King Schoenfeld

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The BULLETIN is sent to every Member of the Garden as one of the benefits of membership. For a contribution of as little as $40 per year, Members also are entitled to: free admission to the Garden, Shaw Arboretum, and Tower Grove House; invitations to special events and receptions; announcements of all lectures and classes; discounts in the Garden Gate Shop and for course fees; and the opportunity to travel, domestic and abroad, with other Members. For information, please call (314) 577-5100.

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Comment

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Involvement and Participation

In reflecting on the last several years, one can only conclude that the Garden's accomplishments are indisputably phenomenal. The Members and staff, who represent the strongest base of support that any institution could conceivably desire, have served as the crucial elements in the Garden's continuing progress and its success.

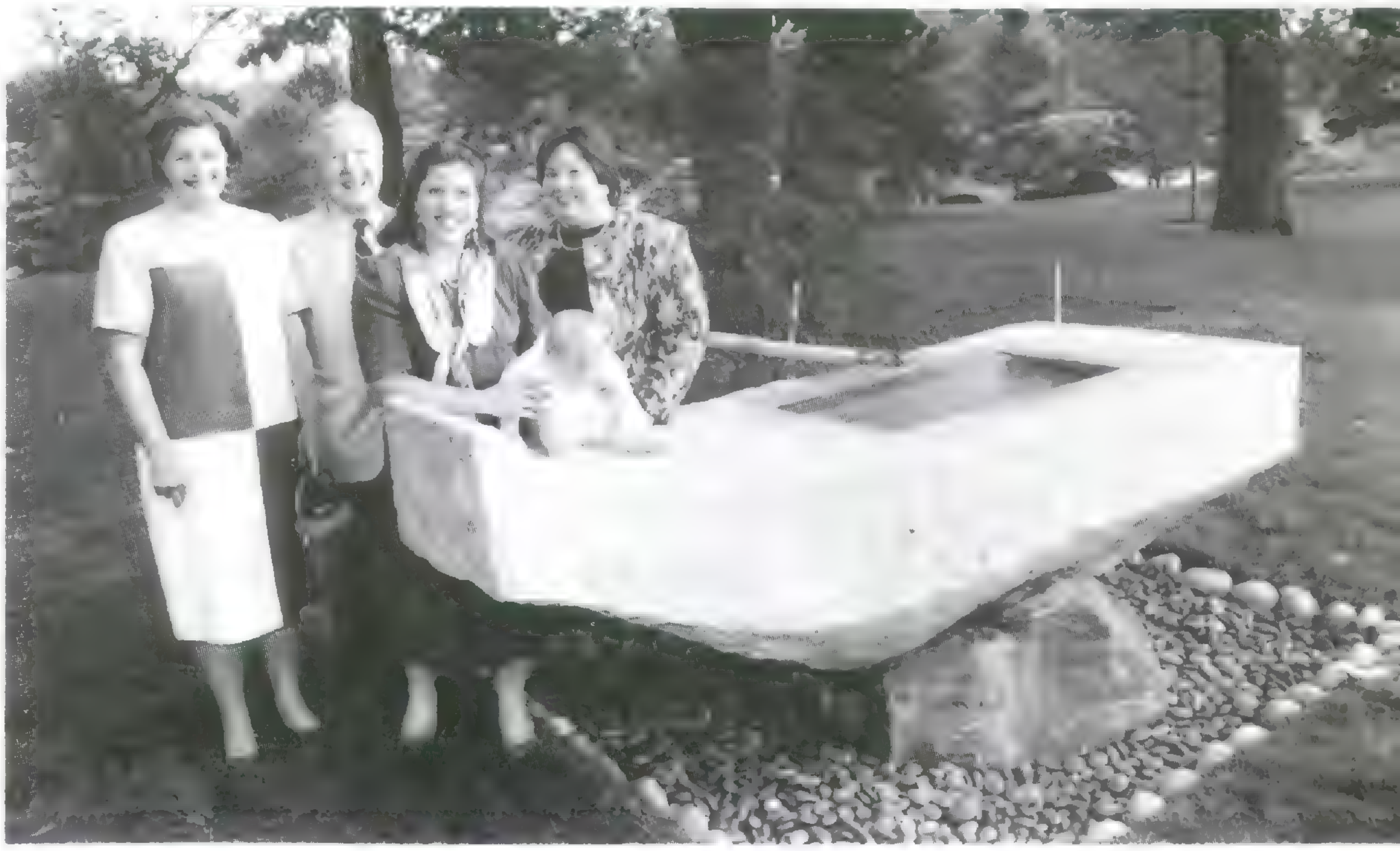
This summer, the outstanding assistance from both members and staff in orchestrating a magnificent Old-Fashioned Fourth of July with Tower Grove Park and the fun filled "Festival of Festivals," kept several hundred volunteers busy throughout June, July and August. The results were obvious and astonishing and every member who volunteered and every staff person who gave additional time and energy to these efforts is to be commended. If adequate financial support can be secured in advance, we hope to continue these delightful summer events next year.

Aside from all of these festivities, July also featured the opening benefit of Lord & Taylor at the Galleria, which was given in honor of the Garden. We extend our warmest welcome and thanks to the new department store, a division of May Department Stores Company, a longtime Garden benefactor.

Looking ahead, members can enjoy the distinctive beauty of the Garden in the fall by participating in the events scheduled for September and October, including a Food Festival featuring nutritious foods and examples of the interrelatedness of nutrition, fitness and the environment (see page 12). Members' events will help you anticipate winter with lectures on fall planting and preparing your plants for the change of seasons. The Urban Gardening Fair and a trip to Shaw Arboretum for a fall foliage walk are among the other special happenings coming up soon.

Your involvement and participation in the Garden are essential. Please join us this fall and enjoy what you have made possible.

Peter H. Raven



The granite boat basin was dedicated in* Seiwa-en, *the Japanese Garden, on July 10, 1991. Designed by the late Koichi Kawana, designer of the Japanese Garden, the boat basin represents Kawana's last work in his ongoing vision for the 14-acre Japanese garden. The sculpture is a gift of the Jones-Weakley family and friends in memory of Edward D. Weakley and A. Clifford Jones, Jr. Pictured at the dedication ceremony are (left to right): Mrs. Edward D. Weakley, The Hon. A. Clifford Jones, Janet Jones Horlacher with Murphy Horlacher, and Irene Clifford Jones.

RICHARD BENKOF

◄ *Christine McMahon inserts a magnetic tape into the RISC 6000. Each tape in the old system was the size of a stack of a dozen long playing records.*

The Cutting Edge

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The Garden's Computer System Acquires "State of the Art" Technology

The IBM RISC 6000 mini-computer exceeds the former computer's memory over a hundred times, in a space the size of a suitcase.

"WE were like kids at Christmas!" said Dr. Nancy Morin, head of the Garden's department of botanical information management. Morin's enthusiasm was shared by her staff when the Garden's new computer arrived early this summer. On June 20-24 a team of computer experts transferred all of the Garden's research data to a new IBM RISC 6000 mini-computer, opening the door for dramatic new advances with the Garden's database system, TROPICOS.

"This new computer is ideal for our needs," said Christine McMahon, systems manager. "It allows us to access the huge resources of mainframe computers at other institutions, while still being able to work directly with colleagues using small personal computers (PC's). Biological research relies on the work of individuals gathering data, often in isolated areas, so we had to keep our system accessible to PC users. With the RISC 6000 we're on the cutting edge of computer technology. It's a high speed, high volume, multiple user system that positions us perfectly for growth in the future."

With 500,000 names now in TROPICOS, the Garden's research program had outgrown the ADS-Mentor computer in use since 1986. This rapid growth is even more dramatic considering that the Garden has only been using computers since 1981.

The new IBM computer, made possible in part by a generous gift from the late Anne L. Lehmann, is one-third the size of the Mentor, but it doubles the number of people who can use the system simultaneously, while increasing the speed of their work with 128 megabytes of RAM memory to the Mentor's single megabyte. This increased power, together with the IBM's advanced UNIX operating system, allows researchers to communicate easily with other systems over the Internet System, a worldwide scientific computer network. Streamlined programming permits faster and more creative information management, facilitating collaboration on major projects such as the *Flora of North America*, *Flora of China*, *Flora Mesoamericana*, and others.

"Modem connections through telephone lines allow us to communicate directly with other computers," Dr. Morin explained. "This new system doubles the number of phone lines we can handle. The Garden Library will be part of the

continued on next page

COMPUTERS continued

network, as are the research departments and libraries at other botanical institutions.

"All of this means that we will be able to make much faster progress in utilizing the information in TROPICOS," Morin continued. "We will be able to develop geographical information systems, maps that will tell us where plants are distributed and what that means for conservation and land use purposes."

The switch from the Mentor system with its PICK operating system to the IBM/UNIX system will take about a year, McMahon predicts. "Everything is in the IBM already," she explained, "and the two systems are running concurrently. This allows users time to retrain using the UNIX system, and gives us time to redesign TROPICOS to utilize the new system fully. We're working on a modular approach with The New York Botanical Garden and teams of researchers representing each group of users. This allows us to customize the software for the maximum utility for everyone. It's an ideal solution to a multi-user system."

"We've come a long way in a very short time," said McMahon. "This is due to the fine work already done by Dr. Robert Magill, Dr. Morin and others who developed the Garden's database system. Our new equipment means we can move ahead, taking advantage of the most current technology now and in the future."

P · R · O · F · I · L · E

RICHARD BENKOF

Christine McMahon

Systems Manager, Botanical Information Management

WHEN Christine McMahon applied for a job in Botanical Information Management at the Garden, she did so out of curiosity. "I couldn't imagine what the Garden would need with a computer database," she said. "Was I ever surprised!"

Christine began her work at the Garden in March, 1991, coordinating the transfer to the new IBM RISC 6000 computer. The project involves redesigning the software for the new UNIX operating system, rewriting the training manuals, and solving all of the individual problems for each research application.

With her previous experience working on airplane flight controls, or avionics, at Emerson Electric and McDonnell Douglas, Christine had extensive background in computers. She earned her bachelor of science degree in industrial engineering from Southern Illinois University at Carbondale in 1987, and is currently working toward a master's degree in management at Webster University.

"Industrial engineers study technical systems and how they work together," Christine explained. "That has been a good background for redesigning the Garden's database system to accommodate the needs of all of its different users.

"When I realized the worldwide scope and significance of the Garden's research program, I was amazed," Christine continued. "I am very excited to be able to work on a project of this importance."

RICHARD BENKOF

Dr. Alwyn Gentry in his office at the Garden.

Alwyn Gentry Is Named Pew Scholar

DR. Alwyn Gentry, senior curator in research at the Garden, has been awarded a prestigious grant for his work in conservation by the Pew Scholars Program in Conservation and the Environment. Gentry was one of ten individuals to receive the $150,000 three-year grant this year. "The 1991 Scholars represent an ideal balance of scholarship and environmental activism," said James E. Crowfoot, director of the Pew Scholars Program. "Not only are the grant recipients outstanding scientists, they also are aggressive problem-solvers who are tackling global environmental problems at local, national, and international levels."

The Pew Scholars Program was established in 1988 by the Pew Charitable Trusts, one of the nation's strongest supporters of environmental projects. The ten scholars selected for the 1991 awards are the second group of Pew Scholars. While they come from widely divergent backgrounds, they all share a common interest in the preservation of biological diversity.

Gentry was honored as one of the world's leading experts on tropical plant taxonomy and as a leader in training indigenous tropical conservationists in Latin America. Gentry is also a leader of Conservation International's Rapid Assessment Team, a "SWAT" team for biodiversity surveys. Gentry, who has been on the Garden staff since 1972, plans to use his grant to pursue his multi-disciplinary approaches to tropical forest conservation, including further investigation of developing sustainable uses of forest products.

The Pew Scholars grants are virtually unrestricted so long as the Scholars apply them in some fashion to their professional endeavors. It is hoped that the awards will free the Scholars to pursue new avenues of inquiry, develop creative approaches to problem-solving and inquiry and take risks that may have equally high probability of success and failure. "The Scholars Program in Conservation and the Environment seeks to provide outstanding individuals with the flexibility to take their knowledge and skills and apply them to some of the world's most pressing environmental issues," said Rebecca W. Rimel, executive director of the Pew Charitable Trusts.

New Flora of Chile

LAST September Charlotte Taylor joined the Garden's research staff as an assistant curator with the task of directing the Garden's work with the *New Flora of Chile*. The Garden has been invited by the Chileans to help coordinate and expedite this project, which represents a new initiative for the Garden.

Chile's deserts, temperate rain forests, and "Mediterranean" zone are unique in South America. Running from the world's driest desert to the glaciers of Tierra del Fuego, Chile resembles more the west coast of North America from Baja California to northern Alaska than the steamy jungles of the rest of South America. Chile's territories are isolated from the rest of the world by cold oceans and high mountains, and as a result its plants and animals are highly unusual. Many are found only here. Some are living representatives of ancient groups that once lived in Antarctica and Australia as well, when these were cool wet continents. Others show surprising links with North America. Chile and Argentina together form the "Southern Cone" of South America. This is an area distinct from the tropical areas of South America where Garden researchers have long been active.

The preparation of a flora is a huge undertaking, a comprehensive study of all the plants of a particular region that requires years of painstaking effort. Chile's first flora—the first complete flora for a South American country—was written in 1845-1850. Since then thousands of new plant species have been described and many new areas explored. Botanists at the University of Concepción in southern Chile have begun the *New Flora of Chile* project by publishing a checklist-style inventory of all of Chile's vascular plants and a complete 600-page bibliography.

Collaboration among botanists from many different institutions is essential to provide the breadth of expertise required. The *New Flora of Chile* project is a cooperative effort of the Missouri Botanical Garden, the University of Concepción, Chile, Ohio State University, and the University of Munich in Germany. More than 50 scientists from various countries will participate in this work. The Garden's expertise in botanical research in Latin America, fundraising, administration, and as a liaison will help significantly to bring this new project to completion.

The *New Flora of Chile* will be published by the University of Concepción Press. It will serve not only as a stimulus for research and an aid to training a new generation of scientists, but will also provide a framework for conservation efforts and informed management of Chile's abundant natural resources.

"It is very exciting to be involved in this flora project," Charlotte Taylor said. "The Garden has a fine reputation for working with colleagues in Latin America, and scientists in Chile have already made enormous progress. This is a very important project, because many of Chile's forests are threatened by pressures of population growth and industry." Taylor, who earned her degrees in botany from the University of Michigan and Duke University, came to the Garden from the University of Puerto Rico.

RICHARD BENKOF

Dr. Charlotte Taylor in her office, with a copy of the Flora of Chile *checklist. A map of Chile is on the wall.*

Starr Foundation Awards Flora of China $250,000

THE *Flora of China* project has received a five-year, $250,000 grant from the Starr Foundation.

Flora of China is a landmark scientific collaboration between botanists in the United States and the People's Republic of China. The Missouri Botanical Garden serves as the U. S. headquarters for the project under the direction of Dr. William Tai. American and Chinese botanists are working to produce the first modern synthesis of information on the plants of China, a condensed revision and translation into English of the existing comprehensive description of the 28,000 species of plants in China. The 12-year project will produce a computer database and will be published in 25 volumes.

The *Flora of China* project is of enormous international importance. Many of the plants in China are found nowhere else in the world, and many are of great economic and medicinal value. Making information on these plants accessible to researchers, educators, horticulturists, and scientists around the world will have far-reaching results.

Peter H. Raven, who serves on the *Flora of China* editorial committee, says, "No work completed for over a century will have treated as many species of plants, nor as many as important to the world. We are deeply grateful to the Starr Foundation for its support."

RICHARD BENKOF

Seated, left to right: Hilda Maria Longhi-Wagner, Renée Fortunato, Tarcisco Filgueiras, Nelson Ramírez. Standing, left to right: Enrique Forero, Jerome T. Loeb, Peter H. Raven.

May Scholars Honored

The Garden hosted a luncheon on August 14 to recognize The May Department Stores Company for its timely support of the May Scholars Program and to honor current visiting scientists. Representing the May Company were: Jerome T. Loeb, vice chairman and chief financial officer; James Abrams, vice president, corporate communications; and Joni Sullivan Baker, manager, corporate communications. Attending from the Garden were Dr. Peter H. Raven, Dr. Enrique Forero, director of research, and Marcia Kerz, director of development.

The May Scholars are Dr. Hilda Maria Longhi-Wagner and Dr. Tarciso Filgueiras from Brazil, Dr. Nelson Ramírez from Venezuela, and Ms. Renée Fortunato from Argentina. The first three were profiled in the May issue of the *Bulletin*. Renée Fortunato received her degree in 1980 from Universidad de Morón in Buenos Aires, Argentina, where she is currently an associate professor of botany. She is also a research assistant of CONICET (National Council for Scientific and Technical Research) working on the staff of the Institute of Biological Resources (INTA) in Buenos Aires. While at the Garden, she will be studying various genera of the Fabaceae, or bean family, for the *Flora of Paraguay* and completing taxonomic treatments of other Neotropical members of the family.

The May Scholars Program enables botanists and graduate students from rain forest countries to study in St. Louis and to take advantage of the Garden's extensive resources, including the herbarium and library. Training scientists from rain forest countries is an integral part of the Garden's program in tropical botany.

In October 1990, a $40,000 grant from The May Department Stores Company Foundation established the program at the Garden. May Scholars are selected on the basis of their current and past significant achievements in botanical research and future plan of work.

Behind the Scenes

Shannon Smith Is New Director of Horticulture

Dr. G. Shannon Smith has joined the Garden as director of horticulture. His appointment was effective August 1.

Before coming to St. Louis, Dr. Smith was the director of research and development with Lone Star Growers of San Antonio, Texas. At Lone Star he directed operations to introduce new ornamental and native plants into industry and worked with international pharmaceutical companies and universities to develop commercial production of medicinal plants.

''The Garden's work in exploration, evaluation and introduction of new ornamental species is an exciting opportunity to pursue one of my major professional interests,'' Smith said. ''Botanical gardens have always been my first love, and I am absolutely delighted to be associated with a facility of the Garden's caliber. I am looking forward to developing the educational aspects of our horticulture program, especially with the Kemper Center bringing in so many new visitors.''

RICHARD BENKOF

''Shannon's professional experience is extensive and ideally suited to the needs of the Missouri Botanical Garden,'' said Dr. Peter H. Raven, director. ''We are quite excited at his arrival and know that he will bring the knowledge, experience and skills necessary to maintain and enhance the beauty and floral displays here at the Garden.''

At the Dallas Arboretum and Botanical Society, Dr. Smith served as president and C.E.O. from 1980 to 1985. He worked to create a new 66-acre botanical garden in Dallas and managed the general administration and development of the Society. Dr. Smith has served on the faculty and has been a lecturer at the University of Tennessee at Knoxville; Massey University, Palmerston North, New Zealand; and the University of Florida, Gainesville.

Dr. Smith holds a Ph.D. in soil sciences and plant physiology from the University of Florida and M.S. and B.S. degrees in ornamental horticulture from the University of Tennessee. Dr. Smith and his wife have two sons in college.

Glades Restoration at the Arboretum

A Unique Missouri Environment

By Lucile McCook, Ph.D.

At first glance, a rocky piece of land ringed by scraggly-looking trees may not appear as interesting as a verdant woodland—but look again. These areas, known as glades, are home to unique assemblages of plants and animals, many of which are specialized for coping with the difficult environmental conditions of glades.

Glades are areas of land where the soil is thin and the bedrock is close to the surface; often, large slabs of rock jut from the soil. In summer, glades are extremely hot, sunny and dry—conditions less than ideal for the extensive roots of most trees and shrubs, or for deeply rooted herbs. But a surprising number of grasses and herbs can tolerate the desert-like conditions of glades. Some of these plants have succulent leaves or hairy leaf surfaces that minimize water loss.

Other species, such as the Missouri bladderpod *Lesquerella filiformis*, occur exclusively on glades and have specialized life-history traits for dealing with the harsh glade environment. Seeds of the bladderpod, a diminutive member of the mustard family Brassicaceae, germinate in the fall, instead of spring, and grow into a tiny rosette of leaves that can survive the ice and snow of winter. In early spring, the rosettes send up yellow flowers that will produce swollen, inflated fruit if they are pollinated, hence the name ''bladderpod.'' By the time the heat of summer has arrived, the plants have shriveled and died—but their seeds have dropped and sit safely in the hot, dry soil. So, the Missouri bladderpod deals with the desert-like glade conditions by avoiding them!

As clever as this life-history strategy seems, it works only as long as the special habitat exists. The Missouri bladderpod, which is grown at the Garden as part of our work with the Center for Plant Conservation, is threatened with extinction largely because the limestone glades where it lives are becoming scarce. It has been estimated that 400,000 acres of glade habitat existed in Missouri before Europeans settled here. At that time, the state had great expanses of prairies, glades and savannah woodland, and natural fires commonly burned in all these areas. Native Americans also burned vegetation because the rich, succulent plant growth following a fire would draw the large grazing mammals that they hunted. As the European settlers built farms, they suppressed fire and many of these habitats changed. If glades are not burned, several tree species can slowly become established over time, shade the habitat, and alter the glade environment such that other plant species can move in and crowd out the unique glade plants. Because of the difficult growing conditions, trees surrounding and invading glades are generally slow-growing and often gnarled and stunted. Some trees, like cedar *Juniperus virginianus*, are so characteristic of glades that we call these habitats cedar glades or cedar barrens.

All glades, however, are not alike. Six types occur in the state based upon the underlying rock. There is a dolomite glade, named for the underlying rock, dolomitic limestone, at Shaw Arboretum located south of the Field House along the Wildflower Trail. Cedars have become established in the glade, so the Arboretum staff has started a glade restoration program that simulates presettlement conditions through careful burning and removal of cedars. This management plan should permit the reestablishment of the unique flora of a dolomite glade. The plans for the new Native Plant and Wildflower Garden at Shaw Arboretum include establishing several types of glades so that visitors can see the diversity of glade habitats. The new wildflower garden is a family gift of Mr. and Mrs. Blanton J. Whitmire.

To learn more about glades and where they occur in Missouri, as well as information on other interesting plant communities, read *The Terrestrial Natural Communities of Missouri* by Paul Nelson (1985 by The Missouri Natural Areas Committee).

Clearing invasive cedars out of Long Glade. Left to right: James Trager, naturalist; Kevin Reed, summer intern, Center for Plant Conservation; Sproule Love, intern, Shaw Arboretum.

RICHARD BENKOF

Volunteer Instructors (standing, left to right): Nan Day, Betty Licklider, Monica Clapper, Sonia Chetta, Maurita Steuck, Alyce Hildebrandt, Irene Weisenhorn, Katherine Chambers. Seated, left to right: Mary Ely and Jean Wrisley, with Dr. Peter Raven, director.

Not pictured: Dorothy Hitt, Pauline Jaworski, Mary Loire, Beatrice Perrin, Gerry Steinhart, Mary Doerr, Judy Garfinkle, Janet Ludewig, Kay Harlan and Ellen Mayer.

Volunteer Evening

THURSDAY, June 27, 1991, the Garden paid tribute to the more than 700 men and women who give so generously of their time, talent and energy as Garden volunteers. Dr. Peter Raven presented awards to several individuals who were recognized for extraordinary contributions:

A Special Achievement Award went to **Billie Beyer** for her work with the Master Gardeners. Billie organized the 1990 Urban Gardening Fair, a major annual event demanding long hours coordinating the efforts of many people. Billie's administrative skills are invaluable and she performed her huge task with warmth and enthusiasm.

The Special Service Award honors volunteers who give time above and beyond their regular volunteer commitment. This year a **Special Services Award** was presented to **Arden Fisher** and **Joan Murphy**, who have coordinated the Tribute Gifts Program for the Development Office since 1982. Joan and Arden developed the program, which matches prospective donors with gift opportunities at the Garden. Arden and Joan are a team of goodwill ambassadors whose tact and compassion are invaluable. They routinely make themselves available from home to answer inquiries on days they are not at the Garden, and the program has blossomed under their skilled organization.

The **Commitment Award** honors a volunteer who conscientiously performs a job every week, even though the tasks may not be glamorous or exciting. This year **Robert Martens** was recognized for his hours of faithful service in the education greenhouse. Bob tends the plants used by the more than 18,800 school children who come to the Garden for classes. Bob works year-round, coming in to help prepare plants for classes and giving extra days when the schedule is especially busy.

The **Group Award** for 1990 was presented to the **Volunteer Instructors**, who work with the thousands of school children who visit the Garden for classes each year. In 1990 the volunteer instructors gave 3380 hours of service assembling classroom materials and teaching. The instructors have years of classroom experience. They assist the education

Corporate Philanthropy Profile

The McDonnell Douglas Foundation and the McDonnell Douglas Employees' Community Fund–East

The McDonnell Douglas Corporation, the country's largest defense contractor and second largest manufacturer of commercial aircraft, and the McDonnell Douglas Foundation, its philanthropic arm, contributed more than $8.5 million in 1990 to non-profit organizations based in its operating locations and nationally. Almost one-half of the Foundation's annual contributions go to education. Significant beneficiaries are colleges and universities, focusing on engineering and technology programs and particularly those encouraging minority enrollment. The Foundation also supports math and science education at primary and secondary school levels. In addition, the Foundation matches McDonnell Douglas individual employees' gifts to their graduating colleges and universities, thus doubling the impact of their gifts; in 1990, these matching gifts amounted to $600,000 of the Foundation's total giving.

The balance of the Foundation's dollars go to civic, government, international, and business causes; health and human services; arts and culture; and the environment, an emphasis area destined for steady increases in support in coming years.

Working in tandem with the corporate foundation is the Employees' Community Fund–East, one of six such funds based around the nation and largely representing the St. Louis metropolitan area. This plan, the administrative expenses of which are covered by McDonnell Douglas but which derives its funds from voluntary employee payroll deductions, contributed about $4 million in 1990 to primarily local non-profit institutions (more than $11 million was disbursed nationwide).

Although the employee plan and the corporate foundation frequently collaborate on team gifts to cases of common interest, the Employees' Community Fund defines its own philanthropic focus, with the corporation's encouragement. In recent years, support has gone to causes dealing with education, the elderly, hunger and homelessness, youth at risk, and, increasingly, the environment.

''It is an exceptional company that not only supports its own corporate foundation but also supports and encourages its personnel to establish their own philanthropic effort,'' observed O. Sage Wightman III, President of the Garden's Board of Trustees. ''This type of partnership is truly a model for the future, as our country confronts a variety of social and environmental needs.''

Added Peter H. Raven, ''Over the past two decades, the Foundation and Employees' Community Fund have been steadfast supporters of the Garden's most important projects. Their generous investments have enabled the construction and partial renovation of the John S. Lehmann Building research facility, the construction of the Ridgway Center visitor facility, and the several improvements just completed through the Campaign for the Garden. Most recently, we received a team grant for a documentary film project we are undertaking on tropical forest areas. We are truly grateful to have such committed colleagues to the Garden's work.''

According to Walter E. Diggs, Jr., President of the McDonnell Douglas Foundation, ''The corporate and employees' funds are moving forward in making environmental issues a priority. We realize the significant contributions the Missouri Botanical Garden makes on these issues—locally, regionally, nationally, and internationally—and we are delighted to lend our support to these necessary efforts.''

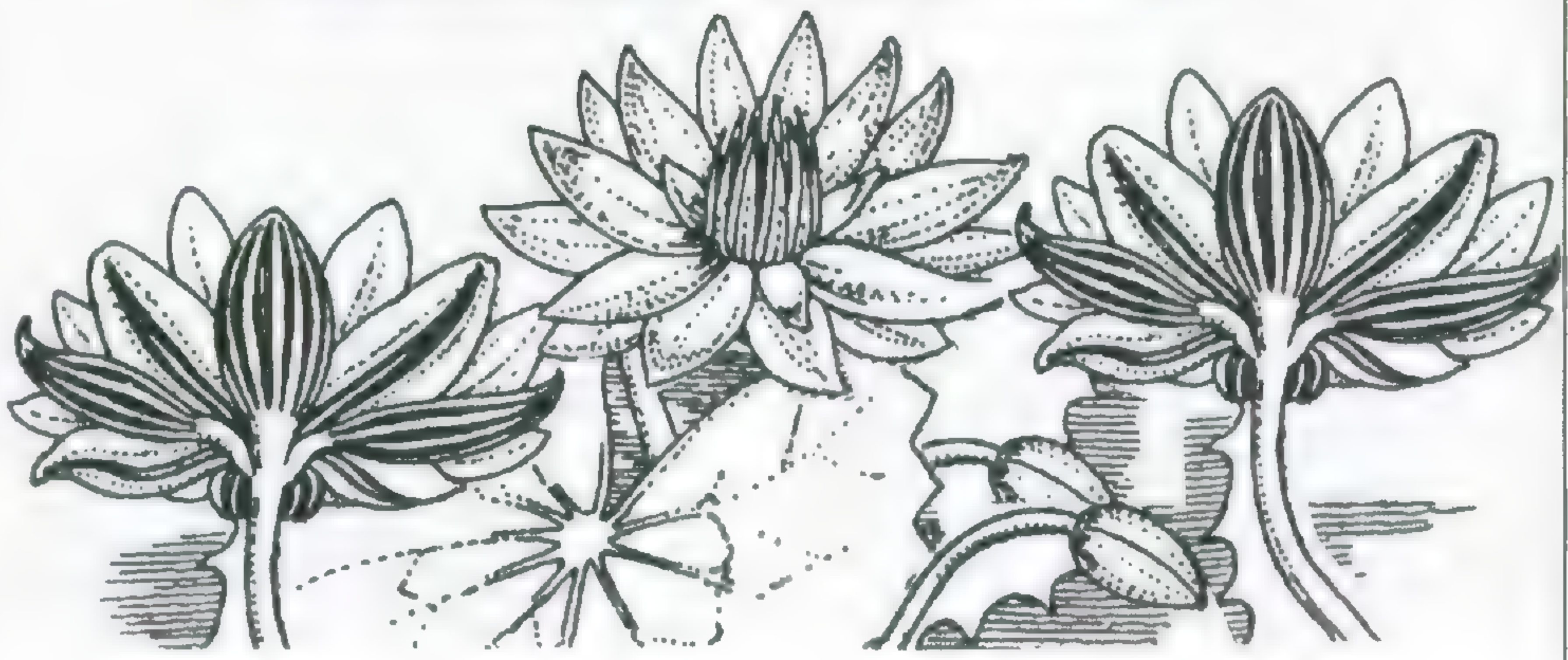
staff with course development and take programs to school classes that cannot visit the Garden.

Dr. Raven said, ''Without our volunteers the Garden would be a very different place, a mere shadow of what it is today.... Your combined contributed service of 70,000 hours has allowed us the time and resources to develop the Garden's Master Plan. Your spirit has supported us in the difficult times and rewarded us in the good times. You have taught us and offered us friendship and there are no words that I can say this evening that can adequately express how grateful we are to you, but I hope these awards that we present tonight will, in some way, convey our deepest thanks.''

RICHARD BENKOF

Other honorees, left to right: Joan Murphy and Arden Fisher; Peter Raven; Billie Beyer and Robert Martens.

Home Gardening



Water Gardening

A water garden in the landscape can bring an immediate sense of tranquility, transforming an ordinary outdoor living space into an oasis.

Ancient Egyptians and Far Eastern cultures were the first to develop water gardens. They have long been common in Europe, and are fast becoming a favorite hobby for experienced and novice gardeners in this country as well. A water garden can be quite sophisticated, with a series of waterfalls and pool levels. Or it can be as simple as a small pond in the corner of the yard or a wooden barrel filled with floating plants and small water lilies.

POOL TYPES

The most popular type of water garden installed today uses a synthetic liner to form the sides and bottom. The liners are quick and easy to install because these materials are lightweight, portable and adaptable to a variety of shapes and sizes. For an even easier installation, select a preformed fiberglass pool. Simply excavate a hole of the same approximate size and shape before you begin to fill it with plants.

The details of selection and installation of pools can be handled by a water gardening products dealer. It might be best to start there if this is your first water garden. Planting and stocking the pool, however, is a personal choice.

PLANTING AND STOCKING

Overall, the real key to water gardening is to establish a balance of plants and wildlife. Too many fish and too many plants or certain types of plants will cause the balance to shift, leading to algal "blooms." It is essential to balance the pond by selecting the right types of plants. Functionally, there are four types to consider planting; deep water plants, bog or marginal plants, oxygenators and floating plants.

DEEP WATER PLANTS

Perhaps the most spectacular of the deep water plants is the hardy water lily, *Nymphae*. The color selection is broad, from white to many shades of pink and red. These plants can be quite fragrant and easy to care for. Blooms float on the pool's surface or several inches above and may last for four to five days, closing every night and opening during the morning hours. It is not unusual to get a succession of bloom that lasts for months. Most water lilies require a spot with full sunlight and at least five hours of direct light each day to keep flowering. They also should be placed in still water and away from pool filter currents and fountains.

Although there are many sizes of water lilies, the most frequent mistake is to plant them in containers that are too small. A soil depth of six to eight inches is sufficient. However, the roots spread laterally and the larger the diameter of the container, the better. Select a pan which is 12 to 14 inches wide to accommodate most small to medium-sized water lilies; 18 to 24 inches for larger selections. The planting depth will also vary; larger lilies will need to be planted in water deeper than 24 inches. Also note that water lilies are heavy feeders and should be fertilized on a monthly basis with pelleted fertilizer pushed into the soil.

Tropical water lilies offer more fragrant and vibrant colored blooms, come in more colors and bloom more often than hardy water lilies, but they are more susceptible to winter injury. Therefore, tropical plants must be removed from the pond and wintered indoors. Hardy water lilies can remain in the pond year round provided the rootstock does not freeze.

Lotus, *Nelumbo*, is a relative of the water lily, but grows larger with blooms extending as much as 10 inches above the water surface. The bloom season is considerably shorter than water lilies, but the lotus's distinctive leaves and seed pods are commonly used in flower arrangements, making them very attractive. Most are hardy and can remain in the pond over the winter. Because of their large container requirement and wide leaf span, lotus are better suited to larger ponds.

BOG OR MARGINAL PLANTS

Plants which grow at the edge of the pond are known as bog or marginal plants. Bog plants grow in mud or in water up to six inches deep. Plants in this category include the cattails, irises, bamboos, rushes, horsetails and tall grasses. They can be planted on a shallow shelf just below the water line in containers. These plants will transform an ordinary pond into a more natural-looking aquatic habitat and will provide protection and seclusion for visiting animals and aquatic insects and amphibians. Some plants, such as cattails, will do well in partial shade, and others, such as irises, must have several hours of full sun in order to flower.

OXYGENATOR AND SUBMERGED PLANTS

Because water gardens generally are small and self-contained, there is not a regular, natural exchange of fresh flowing water other than rainwater. Water oxygen can become depleted, especially during the heat of summer, and algae may begin to grow, causing the pond to become stagnant. To help avoid this problem, a group of plants which remain submerged just below the surface can be added to the pond to replenish the oxygen supply, adsorb carbon dioxide, add nutrients and provide food for fish plus a place for them to spawn and hide.

A few of the most commonly used oxygenator plants include elodea, *Anacharis*; fanwort, *Cabomba*; hornwort, *Ceratophyllum*; and parrot's feather, *Myriophyllum*. These are relatively inexpensive and will multiply in the pond to the point where you may need to harvest them periodically. They also are quite winter hardy.

FLOATING PLANTS

Using floating plants in your water garden can also help limit the growth of algae by covering the water surface, reducing the sunlight that algal growth requires. Floating plants do not need soil. They simply adsorb nutrients directly from the water and are very easy to grow. This group includes fairy moss, *Azolla*; water hyacinth, *Eichhornia*; frogbit, *Hydrocharis*; water lettuce, *Pistia*; and duckweed, *Lemna*.

FISH

When pond fish are added to a pool, it takes on another dimension of beauty. Ecologically, fish can be quite useful for eating excess foliage from overgrown plants, consuming mosquito larvae and other aquatic insects.

The two most popular choices are pond-bred goldfish and Japanese Koi. Both are very hardy and survive winters by hibernating at the bottom of the pond. Goldfish can become very large, growing to a foot or more in length and requiring a larger pond. Koi can also become quite large fish, growing to two or three feet in length.

Avoid overcrowding when stocking your pond. Allow one square foot of water surface area for each inch in length of your fish. When introduced into a new pond, fish will need to be fed until some of the plant materials and algae have grown large enough to be eaten. In winter, fish do not require food.

Plants should be introduced into the pool during the growing season and allowed to grow for five to six weeks before you stock the pond with fish.

CARING FOR THE WATER GARDEN

Generally, a water garden requires minimal care. However, you should expect to clean it periodically, removing leaves and debris so that organic sediment does not build up on the bottom and make it necessary to drain it more often than every five years.

Immediately after installation and in the spring, algae will flourish and cloud the water. The algal growth is promoted by the warming effect of sunlight on the water. Once the aquatic plants cover at least 75 percent of the pool's surface, it will be less subject to algal growth. Filters will assist in removing organic particles from the water, further reducing algal growth. Algicide can be used, but care should be taken to use a product that will not harm fish. Also, avoid stirring up the bottom sediment which contains nutrients that stimulate algal growth.

Maintain the water level at the top of the pool. This is especially important during the summer, when evaporation is rapid. Top off the pool every few days, rather than letting the water level drop for an extended period and refilling all at once. Pools maintained properly will help the plants and aquatic wildlife to remain healthy.

When the pond has been well stocked with a good balance of plants, fish will have plenty to feed on from the developing community of pond organisms. Ponds that become overcrowded with plants will become stagnant. To prevent this, start new plants, keep the foliage healthy and divide when they become overgrown. Marginal plants growing on the pond's edge should be divided every two to three years while submerged plants like water lilies can be divided every three to four years. Plants will differ in growth and maintenance requirements, so become familiar with the plants you have and their needs.

As winter approaches, you will want to clean the debris more regularly to keep falling leaves from decaying in the bottom of the pool and upsetting the oxygen balance. If leaf fall becomes especially heavy, the pool can be covered with a screen or net.

Ponds in very cold climates may need to be closed for the winter. This can be done simply by removing the filter system and letting the pond sit until spring. Hardy water lilies should be moved to the deepest part of the pool. If the pond is likely to freeze completely, then plants and fish should be removed and stored in their containers at temperatures above freezing. Tropical plants and water lilies should be taken indoors.

Preventing a pond from freezing can be accomplished with use of a heater. As long as the rootstock of plants does not freeze, most should overwinter very well. The same goes for most pond-bred fish. If ice covers the surface for more than two weeks, it should be removed to allow air exchange. Fish enter a state of dormancy where body functions are reduced to a minimum. They do not require feeding during winter.

Water gardens require only a small investment of time and effort. You will be rewarded with an intriguing and beautiful addition to your landscape.

—Steven D. Cline, Ph.D.
Manager, Kemper Center for Home Gardening

Timely Tips from the Answer Service

Do you have a plant question? Call the Horticultural Answer Service, Monday through Saturday, 9 a.m. to noon, at **577-5143.**

September Tips

- Herbs such as parsley, rosemary, chives, thyme and marjoram can be dug from the garden and placed in pots for growing indoors this winter.
- Except tulips, spring bulbs may be planted as soon as they are available. Tulips should be kept cool in the refrigerator until planting in late October.
- Begin readying houseplants for winter indoors. Prune back rampant growth and protruding roots. Check for pests and treat if necessary. Houseplants should be brought indoors at least one month before the heat is normally turned on.
- Perennials, especially spring bloomers, can be divided in late September. Enrich the soil with peat moss or compost before replanting.
- Divide peonies now. Replant in a sunny site and avoid planting deeply.
- Pinch off any young tomatoes that are too small to ripen. This will channel energy into ripening the remaining full-size fruits.
- Begin fall seeding or sodding of cool season grasses. Seedbeds should be raked, dethatched or core-aerified, fertilized and seeded. Keep newly planted lawn areas moist, but not wet.
- Cool season lawns are best fertilized in fall. Make up to three applications between now and December. Do not exceed rates recommended by the fertilizer manufacturer.
- Lawns may be topdressed with compost or mil-organite now. This is best done after aerifying.
- Newly seeded lawns should not be cut until they are at least two or three inches tall.

October Tips

- Continue watering, especially evergreens if soils are dry.
- Transplant deciduous trees once they have dropped their leaves.
- Plant tulips at the end of the month.
- The average first frost usually arrives in St. Louis about October 15-20.
- Place wire guards around trunks of young fruit trees for protection against mice and rabbits.
- Broadleaf herbicides can be applied in mid-month to control cool season weeds such as chickweed and dandelion.
- Continue mowing lawns until growth stops.
- Keep leaves raked off lawns to prevent smothering grass.

—Chip Tynan, The Answer Service

Kemper Center for Home Gardening

Open 10 a.m. to 4 p.m. daily. Plant Doctor available 10 a.m. to noon and 1 to 3 p.m. Monday through Saturday. Free with regular Garden admission.

Tower Grove House Tea Room

Open for luncheon Monday through Friday, 11:30 a.m. to 1 p.m., February through November, advance reservations only. Call 577-5150.

Garden Walkers' Breakfast

7 to 10:30 a.m., every Wednesday and Saturday. Restaurant and grounds open early; free admission until noon. Sponsored by the American Heart Association. Call 577-5125 for information.

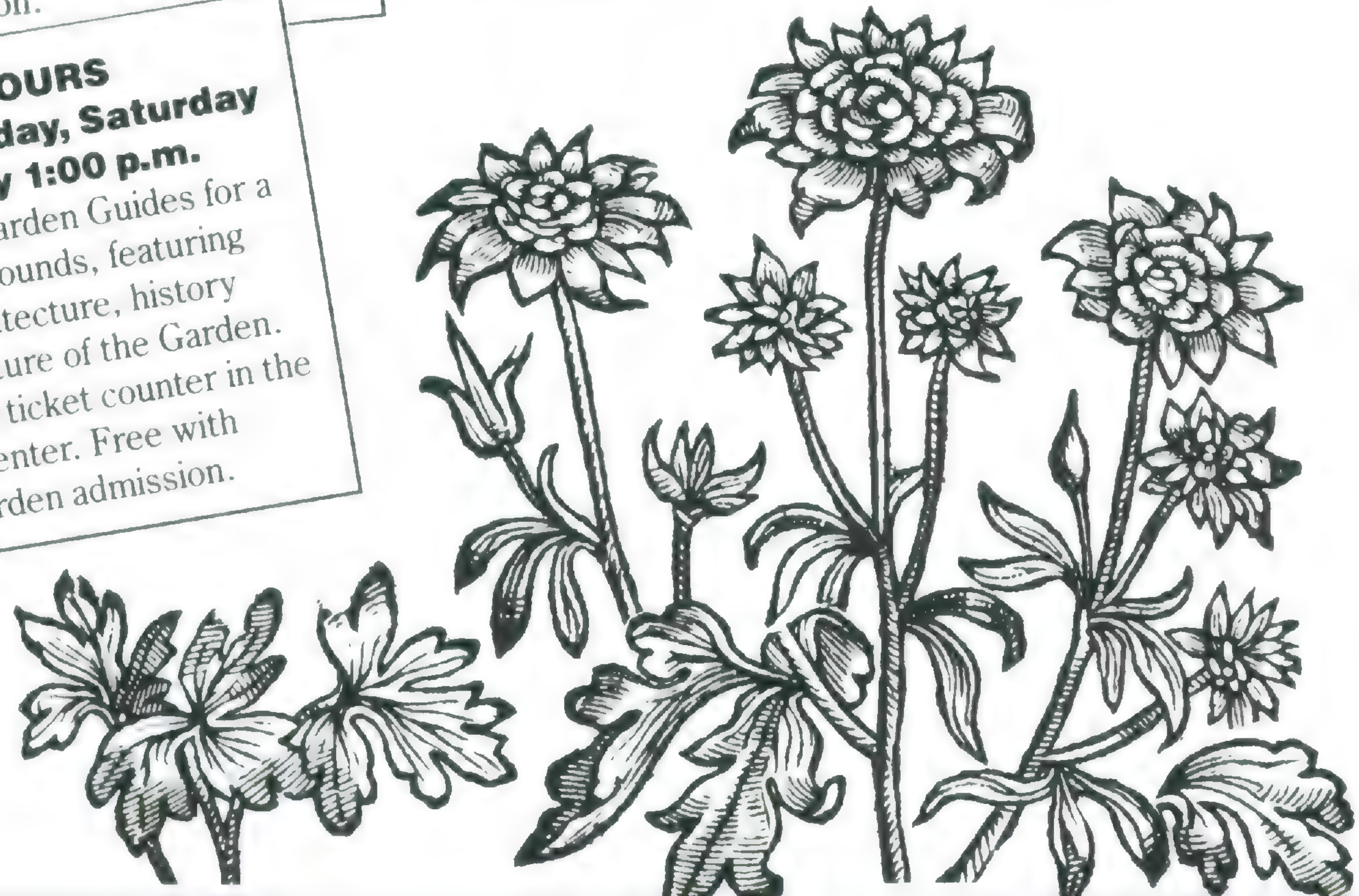
WALKING TOURS
Every Tuesday, Saturday and Sunday 1:00 p.m.

Join the Garden Guides for a tour of the grounds, featuring the art, architecture, history and horticulture of the Garden. Meet at the ticket counter in the Ridgway Center. Free with regular Garden admission.

Missouri Botanical Garden
CALENDAR OF EVENTS
September-October 1991

SEPTEMBER 28/SATURDAY
Food Festival 1991: ''Earthly Delights''

8 a.m. to 3 p.m., Ridgway Center, Kemper Center and grounds. The St. Louis Chapter of the American Heart Association teams up with the Garden to show that nutrition, fitness and environmentalism go hand-in-hand. Demonstrations and samples include breads, herbs, exotic fruits and vegetables plus lean and luscious desserts. Master Gardeners will lead heart-healthy walks through the Garden. Special activities for children. Free with regular Garden admission.



SEPTEMBER 10
Special Members' Lecture: ''Magic in Small Places''

7:30 p.m., Shoenberg Auditorium. Linda Yang, noted author and lecturer on gardening, discusses making the most of containers and gardens that are limited in size. Meet Linda following the lecture, when she will autograph her new book, *The City Gardener's Handbook: From Balcony to Backyard* (Random House). Lecture is free. Limited seating.

SEPTEMBER 21/MEMBERS' DAY
Lecture: ''Put Your Garden To Bed''

10:30 a.m. and 1:30 p.m., Shoenberg Auditorium. A member of the Garden's horticultural staff will discuss fall planting and tell you how to prepare your gardens and yard for next spring. Free, for members only. Seating is limited.

September 27 through October 6, 1991 is Australia Week in St. Louis. For more information or to request a calendar of events, please call 576-0727.

SEPTEMB

1-8 SUNDAY-SUNDAY

Henry Shaw Cactus Societ Show

9 a.m. to 8 p.m. through Labo
9 a.m. to 5 p.m. daily thereaft
magnificent display of unusua
plants, some of which are for
Free with regular Garden
admission.

14 SATURDAY

Exhibit: ''Emerging Legacy

9 a.m. to 5 p.m. daily through
October 20, Ridgway Center.
nal sculptures, paintings and
in other media by African-Am
women artists from Missouri
sponsored by Portfolio, a non
visual arts organization. Free
regular Garden admission.

14-15 SATURD SUND

Greater St. Louis Men's Ga Clubs Show

Noon to 5 p.m. Saturday, 9 a.
p.m. Sunday, Ridgway Cente
juried show, open to any amat
gardener. Includes displays o
types of plants and flowers, r
vegetables, fruits, house plan
cacti, even home canning. Fr
regular Garden admission. E
will be judged on Saturday mo
Call 721-5429 for more inform

15 SUNDAY

Daylily Association Sale

10 a.m., Ridgway Center. Th
souri Botanical Garden Dayli
Association offers extra plant
sale from the Garden's collec
All proceeds benefit the Gard
Come early, as supplies go qu

16 MONDAY

Plant Clinic

9 a.m. to noon, Kemper Cent
Master Gardeners are on han
diagnose your problems with
dens, house plants, tree and l
care, and to suggest solutions
ples of sick plants are welcom
Free with regular Garden
admission.

22 THURSDAY-SUNDAY

lb Sale

rs' Pre-Sale 9 a.m. to 6:30
ursday and Friday; public is
9 a.m. to 5 p.m. Saturday
day: Orthwein Floral Hall
den Gate Shop. Thousands
g blooming bulbs will be on
luding lilies, irises, tulips,
and hyacinths. Members
20% off all merchandise, all
s.

21-22 SATURDAY-SUNDAY

Urban Gardening Fair

Noon to 5 p.m. Saturday, 9 a.m. to 5 p.m. Sunday, Kemper Center for Home Gardening. Ninth annual fair includes displays and presentations, a juried show, and activities for children. Entries will be judged on Saturday morning. See story below.

28-29 SATURDAY-SUNDAY

Greater St. Louis Dahlia Society

Noon to 5 p.m. Saturday, 9 a.m. to 5 p.m. Sunday. A spectacular display of blooms in all sizes and colors. Free with regular Garden admission.

29 SUNDAY

Boomerang Exhibitions

11 a.m., 12:30 p.m., 2 p.m. and 3 p.m., Shoenberg Auditorium. A special treat for Australia Week! World champion indoor boomerang thrower Dr. Barnaby Ruhe demonstrates his art. Sponsored by the St. Louis Boomerang Club and Return to Sender Boomerangs. Free with regular Garden admission.

OCTOBER

UNDAY

ia Week Lecture:
ginal Cave Art"

Shoenberg Auditorium. A
cture by David Talonn, who
Australia in 1990 with Earth-
o document the rock painting
the Wardaman people. Free
gular Garden admission.

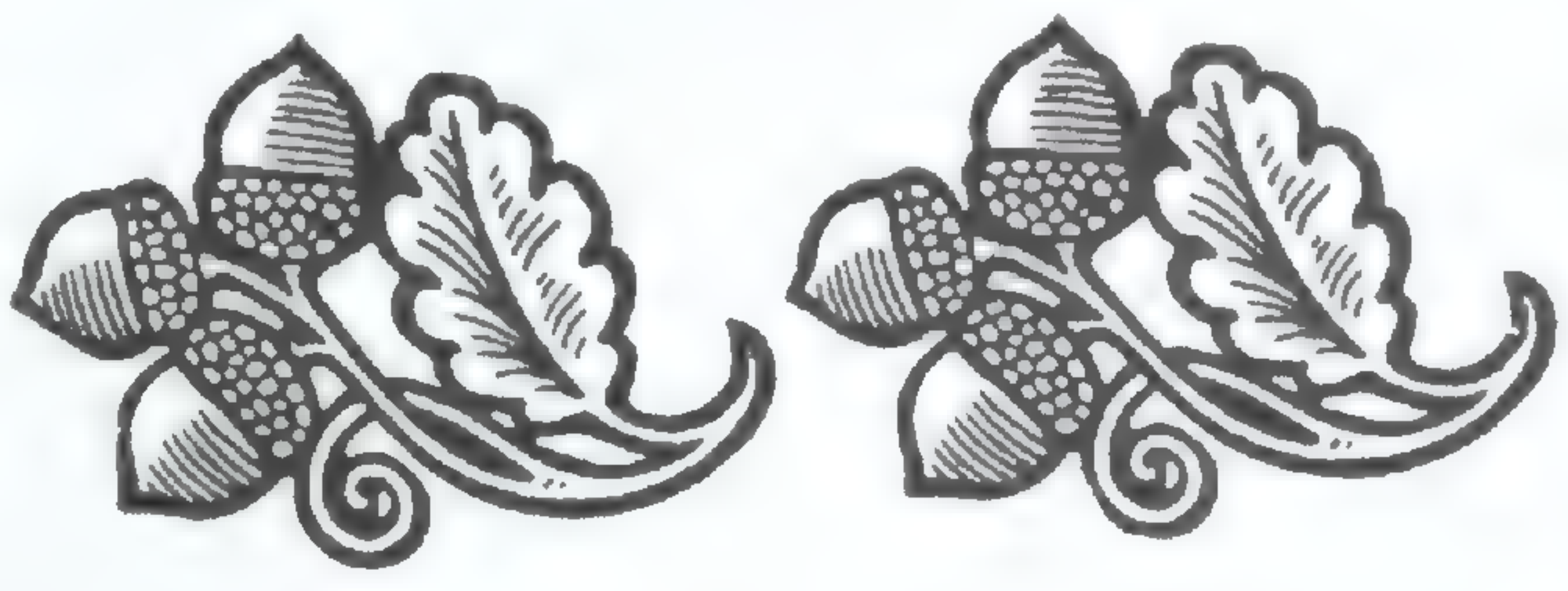
3 SATURDAY-SUNDAY

y West Gesneriad
Show

5 p.m. Saturday, 9 a.m. to
Sunday, Ridgway Center.
ng plants of the popular
violet family. The show is
ed to Lois Russell, a founder
and devoted member of the society. Call 644-3398 for more information. Free with Garden admission.

OCTOBER 9/MEMBERS' DAY
Arboretum Fall Foliage Walk

11 a.m. to 2 p.m., Shaw Arboretum. Drink a cup of cider while you walk through the Arboretum and enjoy its beautiful fall coat of vibrant colors. Free, for members only.



nnual Urban Gardening Fair At Kemper Center

The Ninth Annual St. Louis Urban
rdening Fair will be held September 21
d 22 at the Kemper Center for Home
rdening. The first major event to be
ld in the Center, it is co-sponsored by
e Garden, University Extension, and
e Gateway to Gardening Association, a
t-for-profit group whose goal is to help
ople with limited income produce their
n food from gardens within their own
mmunities.

The Urban Gardening Fair is an annual
ent for community gardeners to
lebrate their accomplishments and
ills in gardening in the Midwest. It is
mprised of a juried competition of gar-
n produce combined with gardening
ctures and demonstrations. The Fair is
all-volunteer event: St. Louis Master
rdeners, who are trained by the Gar-
n and University Extension, will pro-
de assistance in many facets of the Fair.

"This year's Fair will be a more intensive educational experience, compared with previous years," said Michael Adrio, Executive Director of Gateway to Gardening. "With the Fair being held in the Kemper Center, the programs will be more focused on gardening. Participants will be able to learn not only from the programs at the Fair but from the displays at the Center as well."

Participants in the Urban Gardening Fair can enter the produce from their gardens, fresh or canned, in the Fair. Entries must be received at the Ridgway Center between 7 and 9 a.m. on Saturday, September 21. Judging will take place 9:30 a.m. to noon on September 21.

Lectures and demonstrations will be presented on a variety of gardening topics, including "How to Compost" and "Canning Your Harvest Produce." Hours for the fair are noon to 5 p.m. on September 21, 9 a.m. to 5 p.m. on September 22. For further information call the Gateway to Gardening Association at 832-0380.

Saturday Gardening Demonstrations

St. Louis Master Gardeners present a variety of gardening programs on Saturdays in the Kemper Center for Home Gardening at the Garden. The demonstrations take place at 1:00 p.m. and are repeated at 2:00 p.m.

Topics include "Revitalizing your Hanging Baskets," "Keeping your Lawn Green," "Air Layering Techniques," "Creating Holiday Decorations from Your Garden" and "Putting Your Roses to Bed." The schedule of topics has been set through December 28, and the program will continue in 1992. The Saturday demonstrations are free with regular Garden admission. For more information on the demonstrations, call the Center at 577-9440.

Wilderness Wagon Rides Again

This fall the Arboretum will again offer narrated tours of the beautiful Ozark countryside on the open-sided Wilderness Wagon on Sundays from September 15 through November 3. Depending on the season, visitors may see delicate wildflowers, the tall grass prairie, fall foliage, many species of birds, or with luck, deer or wild turkey. The Wagon leaves the Visitor Center on an hourly schedule and stops at the Trail House. Visitors may spend time walking on the woodland trails and return to the Visitor Center on a later trip.

The Wilderness Wagon also may be reserved by groups Monday through Friday from 8:30 a.m. to 4:00 p.m. For more information on the Sunday tours or group rentals, please call the Arboretum at 1-742-3512 or 1-742-0850.

From the Membership Office

MEMBERS' TRAVEL PROGRAM

Madagascar

OCTOBER 18 TO NOVEMBER 1, 1991

Madagascar, an island off the east coast of Africa, is one of the world's biological treasures. It is home to 10,000 plant species, three-quarters of which are unique to the island. Many of the island's extraordinary plants and animals have never been seen or studied by scientists.

However, deforestation has already destroyed 90 percent of the country's forests. Many of its plants and animals are extinct or threatened with extinction in the next 20 to 30 years.

The Garden has been working in Madagascar since 1972, conducting research and assisting Malagasy scientists in developing research and conservation programs. The Garden has collaborated with Malagasy government agencies to plan and secure funding for Tsimbazaza Botanical and Zoological Park and for a 1200-square mile national park on the Masoala Peninsula, the island's only remaining virgin rain forest. The national park is a landmark project combining land preservation with local economic development.

The tour for Garden members will be led by Dr. George Schatz, the Garden's resident research botanist in Madagascar, and by Tamra Engelhorn Raven. Mrs. Raven, wife of the Garden's director Peter H. Raven, earned a master's degree in biology from Stanford University in 1972. A world traveler who works closely with the Garden's research program, Mrs. Raven has written and lectured widely on the crisis of tropical deforestation.

Mrs. Peter H. Raven

This tour offers Garden members an extraordinary travel experience. Observe at first hand the Garden's work in preserving the Earth's precious biological heritage for future generations, led by knowledgeable guides. For more information on this exciting adventure call Brenda Banjak at (314) 577-9500.

GEORGE SCHATZ

The Bay of Antongil, seen from the Masoala Peninsula of Madagascar.

Membership Dues To Increase in 1992

Membership dues for regular level members at the Garden will increase from $40 to $45 in 1992. There will be no increase for older adults 65 years of age and over. That membership will remain at $40 and will include the same benefits as a regular membership. Benefits for a regular membership are:

- Free admission for two adults and children under the age of 18.
- More than 20 invitations during the year to special Garden events including four "members only" flower show previews, 12 members' days, and four or more major members' events.
- A 10 percent discount at the Garden Gate Shop.
- Free subscription to the bimonthly *Bulletin*.
- Free reciprocal admission at other botanical gardens throughout the country.
- Discounts on education classes and facility rentals at the Garden.
- Travel opportunities through the Membership Travel Program.

The new dues structure will take effect January 1, 1992. Members renewing prior to that time can renew at the $40 level.

Moving? Please Remember To Send Us Your New Address.

To avoid missing any of your membership mailings, you *must* give us your new address at least three weeks *before* you move. Please enclose the mailing label on the back cover of this *Bulletin*, and mail to: Membership Office, Missouri Botanical Garden, P.O. Box 299, St. Louis, MO 63166.

Name:____________________

Old Address:

____

City____________________

State__________ Zip__________

New Address: (Date effective:__________)

____

City____________________

State__________ Zip__________

RICHARD BENKOF

Left to right: Committee chairmen Ellen and Henry Dubinsky, Nora and Walter Stern, Kathy and Sam Hayes, Marshall Hilsberg and Pat McAllister.

Lord & Taylor Salutes the Garden

Wednesday, July 24, 1991, Lord & Taylor at the St. Louis Galleria was the setting for a spectacular premiere party celebrating the opening of the store. Lord & Taylor chose the Garden to be honored by the benefit, and the beautiful decorations were inspired by features of the Garden's landscape: the Gladney Rose Garden, the Milles sculptures and the water lily pools, the Climatron, and the Japanese Garden. Party goers at the black tie affair were serenaded by musicians throughout the store, dined at elegant buffets, and received complimentary gifts from Lord & Taylor.

We are grateful to the May Department Stores Company and to Marshall Hilsberg, Chairman and Chief Executive Officer of Lord & Taylor, for hosting this lovely evening in honor of the Garden. We also extend special thanks to: Arthur Andersen & Co.; The Boatmen's National Bank of St. Louis; Enterprise Leasing Company; Mr. and Mrs. Sam Fox; Jefferson Smurfit Corporation; and Mercantile Bank of St. Louis N.A.

A Golden Anniversary Cooking School

In honor of the St. Louis Herb Society's 50th anniversary, preparation of a festive celebration dinner will be demonstrated by members of the Society at the Laclede Gas Kitchens, 4118 Shrewsbury Avenue on Wednesday, September 25, 10 a.m. to noon. The presentation will feature recipes suitable for the upcoming holiday season and will use a variety of herbs. Preparation of a complete menu of appetizers, salad, a main entree, vegetables, bread and dessert will be illustrated. You will come away with wonderful ideas for your holiday entertaining! Samples of appetizers and holiday breads will be provided along with a refreshing herbal punch. Recipes for all samples and demonstration items will be supplied. There is a fee of $15 for members, $18 for non-members, per person. Advance registration is required and reservations are limited. Call 577-5140.

From the Garden Gate Shop

Fall Bulb Sale

Members' Pre-Sale
Thursday and Friday
September 19 and 20, 1991
9:00 a.m. to 6:30 p.m.

Public Invited
Saturday and Sunday
September 21 and 22, 1991
9:00 a.m. to 5:00 p.m.

Visit Orthwein Floral Hall for spring blooming bulbs including species, hybrids, naturalizing and indoor forcing bulbs, plus hardy mums in Fall colors. The Garden Gate Shop features gardening tools and accessories, gifts, books, and stationery. Members will receive a 20 percent discount on all merchandise, all four days.

1992 Calendar Featuring Photographs by Jack Jennings

The spectacular new Missouri Botanical Garden Calendar for 1992 is now available in the Shop. It is printed in full color on recycled paper.

The 16 x 12 inch poster-size calendar features photographs of the Garden taken by Jack Jennings. A native of St. Louis, Jack began photographing the Garden in 1978. He takes thousands of slides every year, in all seasons and types of weather. The 1992 Calendar is his eleventh, and his beautiful photographs are cherished by all who love the Garden. The 1992 Calendar is available in the Shop or by mail (see form at right) at $10.95.

1992 Calendar Order Form

Please send me __________ Missouri Botanical Garden Calendars at $10.95 each (plus $2.75 postage and handling).

NAME __________________________

ADDRESS __________________________

CITY _______ STATE _______ ZIP _______

TELEPHONE __________________________

☐ Enclosed is my check for $______________ .
Payable to: Missouri Botanical Garden

☐ Please charge:
VISA/MC No. ____________________

Expiration date ____________________
Name as it appears on card:
____

Mail to: Missouri Botanical Garden
Garden Gate Shop
P.O. Box 299, St. Louis, MO 63166

Halloween Fun at the Shop

Attention all goblins, ghosts, witches, warlocks and bats! The Garden Gate Shop has gifts and decorations to make your Halloween celebration a real treat!

An Old-Fashioned Fourt

Forty thousand St. Louisans—family and friends, young and old—came to the Garden
Tower Grove Park for an old-fashioned Independence Day celebration and picnic, and a go
time was had by all.

The event was co-chaired by Nora Stern, a Trustee of the Garden and a member of th
Members' Board, and Ann Auer, representing Friends of Tower Grove Park. Our special
thanks go to the committee and to the more than 250 volunteers and staff who helped to
the day a success. We also are very grateful to the sponsors of the event: Amoco Oil Com
Coin Acceptors, Inc., Coleman/Fannie May Candies Foundation, Commerce Bank of St.
Cupples Company Manufacturers, Pepsi-Cola, Shop N'Save, Southwestern Bell Corpora
Mr. and Mrs. Robert E. Kresko, Mr. William K. Orthwein, Mrs. Marion K. Piper, and the
St. Louis Post-Dispatch.

RICHARD BENKOF

f July

naps friends and neighbors said it best:

'I just had to drop you a note and tell you how much our family yed the Old-Fashioned Fourth of July celebration that you and the s at Tower Grove Park put on. It truly was a good old-fashioned The planning and organization were excellent, the activities/ rtainment were just right, and everything ran so smoothly. as a relaxing, family-oriented day and we enjoyed everything ut it!''

—The Eichwald Family, Richard, Jill, Maggie, Tom

''On the 4th of July 1991
we stopped,
as a nation,
to celebrate our freedom.
It was my fortieth fourth.
From childhood to parenthood
they have all been different.
Some quiet, some wild.

This one, for me,
the most meaningful.
This independence day I spent with
my family and my neighbors
in Tower Grove Park
and the Missouri Botanical Garden
who produced an ''Old-Fashioned
Fourth of July''.

That day,
there was an elegance of spirit,
all around.
A simple, joyful,
sense of community.
No hype, no hustle, no bravado.
Just a gentle coming together
in a beautiful, peaceful setting
to commend our liberty.
A glimpse of America I long to
feel again.''

—Walter F. Gunn,
Resident, City of St. Louis

Center for Plant Conservation

CPC Assisting in Biocontrol

A number of federal agencies, state agencies and university groups are involved in the biological control of various exotic, introduced weeds. One of the more pervasive of these weeds is leafy spurge (*Euphorbia esula L.*), a deep rooted perennial member of the Euphorbiaceae family. A native to Eurasia, its introduction into North America in 1872 has caused serious problems for ranchers in western and mid-western states. Infestations in the Midwest and western states appear to be unrelated to the eastern infestations and are thought to have originated in eastern Europe from importations of grain and grass seed contaminated with the weed seed.

Leafy spurge is an aggressive perennial which tends to displace other vegetation in pasture and rangeland habitats. Reductions of forage from 10 percent to 100 percent have been observed. Leafy spurge currently infests more than 1.2 million acres in North Dakota alone. Agricultural economists at North Dakota State University estimate that the weed results in annual losses of nearly $9 million in North Dakota. The impact of leafy spurge upon the native flora remains largely unknown.

Biological control of weeds usually involves the use of insects and/or pathogens to attack and control the density and dispersal of the weed. The classical form of biological control utilizes biological control agents collected from areas where the weed is native. Biological control agents are closely screened prior to release to insure that they do not attack economically important plants or native plants, especially native plants which are considered threatened or endangered.

It is with this last point that the Center for Plant Conservation has been assisting various researchers around the world in their search for effective and safe biological control agents of leafy spurge.

Through a contract and cooperative agreement with the United States Department of Agriculture, Animal and Plant Health Inspection Service, the CPC through its affiliated botanic gardens has collected and propagated various native Euphorbia species. Following collection and/or propagation by the participating botanic gardens, the plant materials are shipped to the USDA, Mission Biological Control Laboratory, Mission, Texas, where additional numbers are propagated from the original stock material.

These plant materials are then provided to biological control researchers at the USDA, Agriculture Research Service at Bozeman, Montana, Frederick, Maryland and Rome, Italy. Living plants and seed are also provided to the International Institute of Biological Control in Delemont, Switzerland. All of these various groups utilize the plants in a screening process to help insure that new biological control agents, whether they be insects or disease pathogens, will not have an adverse effect on our native spurges.

The CPC has been instrumental in coordinating the collection and propagation activities with various botanic gardens within the United States. Plant materials for the weed biological control programs have been provided by the San Antonio Botanic Gardens, Bok Tower Gardens, the University of California Botanic Garden, Garden in the Woods, and the Holden Arboretum.

—Paul E. Parker
Assistant Laboratory Director
United States Department of Agriculture
Mission Biological Control Laboratory
Mission, Texas

From *Plant Conservation*, Summer 1991, Vol. 6, No. 1. Published by the Center for Plant Conservation, reprinted by permission.

Mellon Grant Continues Support

The Andrew W. Mellon Foundation has announced a two-year grant of $300,000 to the Center for Plant Conservation for the years 1991-1992. The grant is the foundation's largest ever to the Center for operating purposes, and will support the organization's continuing efforts to build a strong network of Gardens maintaining the National Collection.

"This grant represents an extraordinary expression of confidence in the Center," says CPC Chairman, William A. Truslow. "We are deeply honored by the continued support and encouragement by this Foundation for our efforts to preserve the native flora of the United States."

The Center is presently completing a challenge grant from the Foundation, which matches contributions to the Plant Conservation Fund to support the maintenance of species in the National Collection. For information on how to sponsor an endangered species, please call the Center's offices at 314-577-9450.

Volunteers Needed

Rapid growth in the Garden's programs has created an urgent need in several departments for volunteers with special skills and interests. If any of these jobs is of interest to *you*, please call Jeanne McGilligan at 577-5187 immediately.

Volunteer Instructors

Energetic people who love children and plants are needed for weekly daytime programs for school groups from kindergarten through sixth grade. There will be eight training sessions at the Garden in late September and October. This is a challenging opportunity to gain knowledge and give children something very special. Call 577-5187 before September 12.

Arboretum

The implementation of the Master Plan has the Arboretum staff working on dozens of new projects. Glade restoration work is described on Page XX, and the July *Bulletin* discussed the new wetlands construction. There is a continuing and growing need for volunteers to work with ecological management, education, history and archives, horticulture, maintenance, and as naturalists.

Plant Records

The March *Bulletin* described the Plant Records office and its work maintaining an accurate computer record of every living plant on the Garden grounds and in the greenhouses. The work requires experience with computer databases, and is a chance to be part of a hard-working team.

Rental Facilities Available A Year In Advance

Garden members and people in the community are aware that many of the Garden's beautiful facilities can be rented for meetings, private parties and weddings. Shoenberg Auditorium, Monsanto Hall, the Spink Pavilion, and some outdoor locations are available, with full catering and support services.

A new policy for booking these facilities recently has been implemented. Now rentals can be arranged up to one year in advance of the date of your event. For assistance in making your reservations and arrangements, call Facility Rentals at 577-5126.

Trustee Profile

Dr. Helen E. Nash

Dr. Helen E. Nash became a member of the Garden's Board of Trustees in June, 1991. A long-time member of the Garden, Dr. Nash has been a dedicated participant in Garden activities for many years.

Originally from Atlanta, Dr. Nash came to St. Louis to complete her internship at Homer G. Phillips Hospital in 1945. She has remained in St. Louis since that time and established a private practice affiliated with St. Louis Children's Hospital in pediatrics.

A dedicated child advocate, she has served as the president of the St. Louis Children's Hospital Staff Association and has been active on several hospital committees. She is presently a professor of clinical pediatrics at Washington University School of Medicine. Concerns about health care and the general welfare of children encouraged Dr. Nash to become actively involved with the St. Louis Children's Hospital Staff Society and other organizations such as the Health and Welfare Council of Metropolitan St. Louis. She also has demonstrated a strong commitment to better understand and provide support systems for the mentally retarded and disabled population and served as president of the Board of the Mentally Retarded and Developmentally Disabled.

Dr. Nash is also a member of the Board of the Saint Louis Symphony and has been a longstanding supporter of it. An avid traveler, Dr. Nash travels widely and has devoted time volunteering in other countries.

"Helen's outstanding interest and expertise plus her wonderful love of the Missouri Botanical Garden will be an enormous benefit to the Garden's effort. We are so pleased that she agreed to serve," said Sage Wightman, Board president.

Dr. Nash has lived in St. Louis since 1945.

Garden Guides Elect New Officers

Newly elected officers for 1991-92 are (above, left to right): Doris Schulte, co-chair; Helen Hilliker, tour schedules; Florence Hoey, co-chair; Catherine Schumann, secretary-treasurer. The Garden Guides are a dedicated group of 87 men and women who lead tours of the grounds and educate visitors about history, horticulture, research, sculpture, architecture, and natural sciences at the Garden. They attend monthly classes to keep their knowledge current and offer tours seven days a week.

IN MEMORIAM

Mrs. William H. Schield

A dear friend of the Garden, Emma Schield, died July 6, 1991 at the age of 92. Mrs. Schield was a longtime Garden member and for many years her generous annual gifts helped to underwrite the cost of the highly popular Garden calendar.

Mrs. Schield was especially pleased that the calendar reached thousands of people throughout the world, depicting the unique beauty of the Garden. Each year the calendar features some of the loveliest views of the Garden, in all seasons.

In addition to the Garden, Mrs. Schield was deeply committed to several other St. Louis cultural institutions, including the Saint Louis Symphony, Saint Louis Zoo, Saint Louis Art Museum, and Opera Theatre of St. Louis. According to her family, Mrs. Schield maintained an active and keen interest in these institutions throughout her life and encouraged them to do the same.

Mrs. Schield's generous support for the Garden's calendar project benefited many people. She will be remembered with fondness for her special role in recording the Garden in such an inspiring and lasting way.

Gift Planning

What is gift planning? Why would a botanical garden have a program devoted to money and estate issues? The Garden's gift planning program is a service to its donors, providing financial and tax information that could be useful to anyone who is considering a gift.

The federal tax laws have long recognized that charitable institutions, like the Garden, are making significant contributions to this society, often relieving the government of the burden of those activities. Therefore, the law includes many provisions to make charitable giving attractive by encouraging private support of charitable institutions. These laws create tax advantages or tax deductions that are available under particular conditions. Benefits may be related to income taxes, gift taxes, or estate taxes.

We are grateful to our friends who support the work of the Garden. Gift planning is a service that we provide to facilitate that support. For more information about the program or about our free publications please call Ernestina Short at 577-9532.

RICHARD BENKOF

◀ *Dr. H. Carroll Parish, adoptive father of Koichi Kawana.*

Memorial to Koichi Kawana Is Dedicated

July 10, 1991, friends of the late Koichi Kawana gathered for a private ceremony at the Garden to dedicate a granite stele placed at the east entrance to the Japanese Garden. Professor Kawana designed *Seiwa-en*, the "garden of pure, clear harmony and peace," and supervised its development until his death last year.

The small granite column, chosen to be in harmony with the landscape, displays the Kawana family crest, Koichi Kawana's name, and the legend "Garden of the Little Prince," an affectionate nickname for Prof. Kawana. The Japanese characters on the stele were carved from calligraphy executed by the Rev. Kanshu Ikuta, a prominent Japanese calligrapher.

Library Receives IMS Grant

The Garden Library has received a grant of $2,162 from the Institute of Museum Services for materials to provide conservation treatment for 2,150 books in the Ewan Collection. The Ewan Collection, purchased by the Garden in 1986, includes the research materials, personal papers, and 5,000 books collected by Joseph Ewan, an eminent historian of natural history. The conservation work will be carried out by Vicki Lee, library conservator, and four volunteers: Paula Brooks, Robert Buck, Patrick Kegin, and Jane Thomas. Because the grant funds cover only a portion of the conservation needed in the Ewan Collection, the library will continue to seek funds to complete the conservation of this important collection.

Constance P. Wolf,
Librarian

Tributes MAY-JUNE 1991

In Honor Of

"A Friend"
Mrs. Mary S. Orr

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Mr. and Mrs. Sol Morton Isaac
Mrs. Ceci Lowenhaupt
Mrs. A. L. Netter Jr.
Mrs. Walter Sears

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Mrs. Riette L. Frank

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Mrs. Rose Anne Davis

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Mr. Francis H. Cabot

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Her children, their spouses, and her grandchildren
Miss Patricia L. McLaughlin
Bill and Shirley Smith
Dr. Brenda Melson
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Mr. and Mrs. Heino Pull
Dr. Peter H. Raven
Missouri Botanical Garden—Members Board
Dr. and Mrs. Stephen L. Post
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Dr. Max Wolfrum
Miss Patricia McCormick
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Mr. William Albrecht
Jo McDonald
Mr. Norris Allen
Mr. and Mrs. Louis M. Ettman
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Mr. David Baron
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Mrs. Dorothy Orthwein Bates
Mr. and Mrs. George Budke
Mrs. Lucille Beall
Scott Beall Family
William T. Bebermeyer
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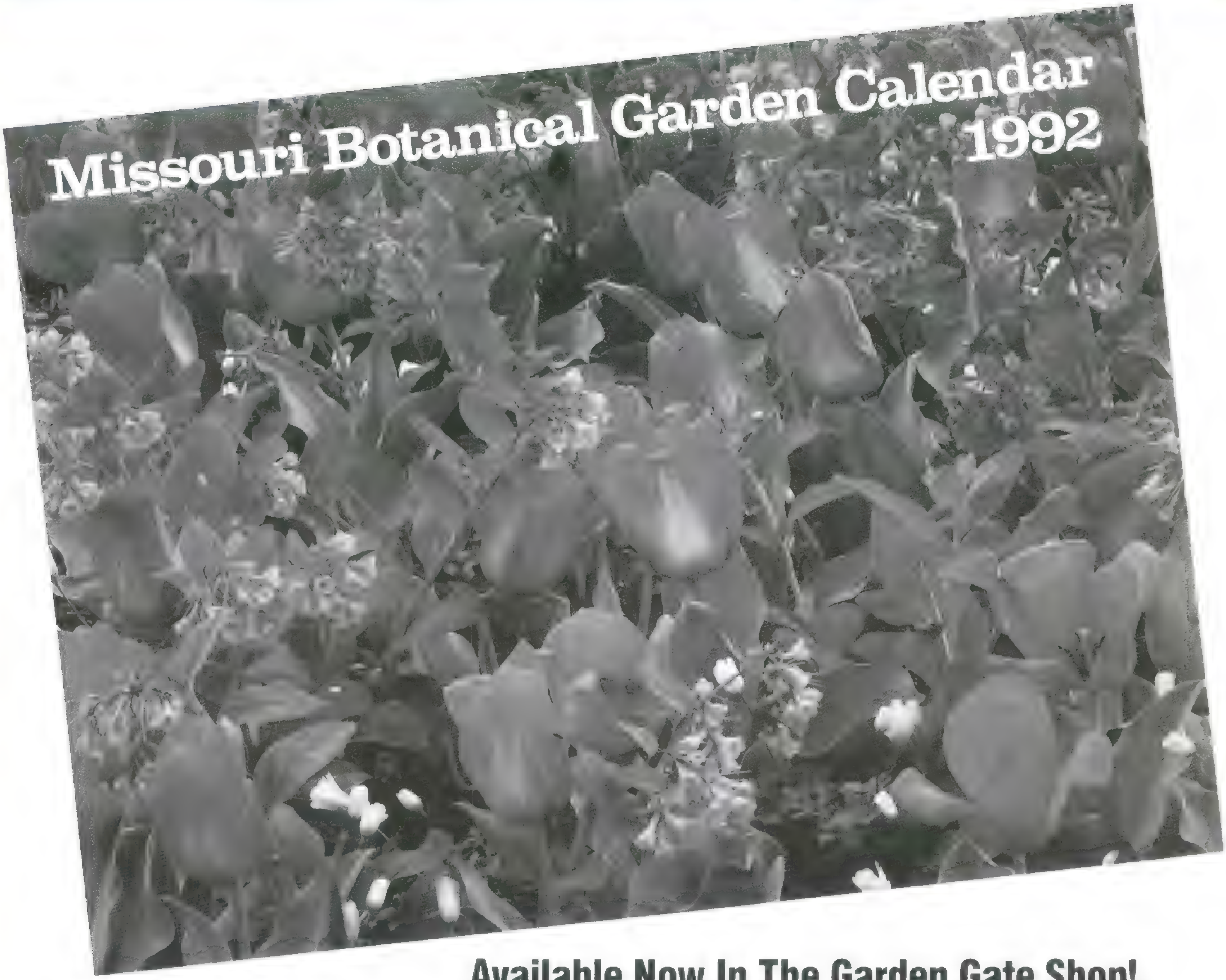

Available Now In The Garden Gate Shop!

The spectacular 1992 Garden Calendars are here. Featuring all new full color photographs by Jack Jennings and a poster highlighting the Garden's research program and the Araceae family, the 1992 Calendar is printed on recycled paper. See page 15.

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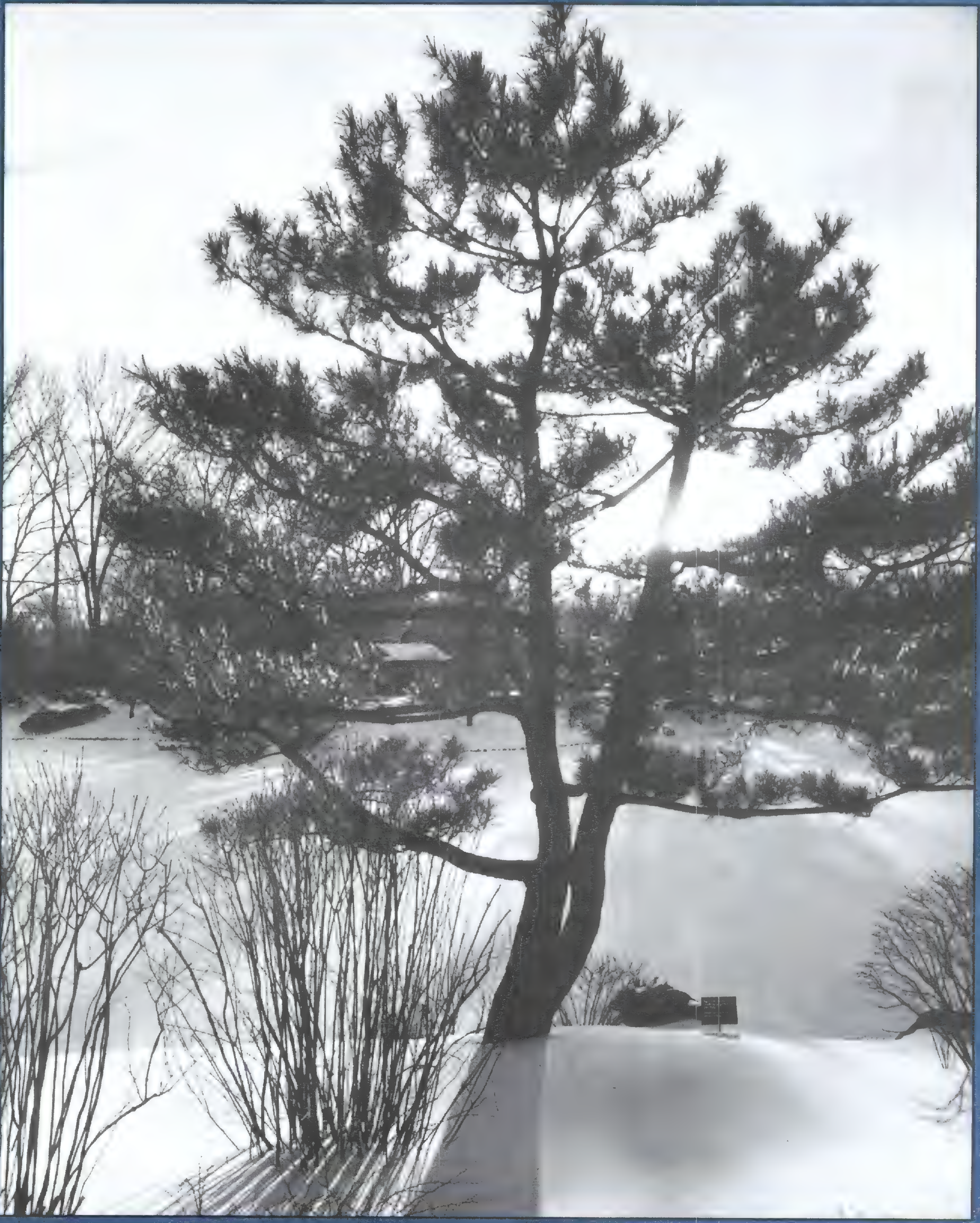

LUME LXXIX
MBER SIX

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On the cover: Winter in the Japanese Garden. *—Photo by King Schoenfeld*

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The BULLETIN is sent to every Member of the Garden as one of the benefits of membership. For a contribution of as little as $40 per year, Members also are entitled to: free admission to the Garden, Shaw Arboretum, and Tower Grove House; invitations to special events and receptions; announcements of all lectures and classes; discounts in the Garden Gate Shop and for course fees; and the opportunity to travel, domestic and abroad, with other Members. For information, please call (314) 577-5100.

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Comment

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Working Together for the Future

The past year has been marked by great progress in a number of areas, and one major disappointment.

As you know, the Garden formulated a plan that would involve expansion of the grounds, and that plan, following four weeks of reaction, was rejected by the community and immediately withdrawn.

Because you, as a member, are so important to the growth and stability of this institution, I wanted to share with you the information about the proposal (See Page 3). My hope is that you will read it and gain a better understanding of an extremely complex and highly publicized issue. If during this process, you were offended personally by what you heard, please accept our deepest regret.

There also have been a number of significant achievements during the past several months.

First and foremost, the members, volunteers, and staff continue to perform miracles in making the Garden and its various parts one of the best in the world.

On June 9, we opened the William T. Kemper Center for Home Gardening, which gives us a magnificent structure to house a new program of education and environmental awareness. We owe a deep debt of gratitude to the Kemper Foundation, the Monsanto Fund, Mrs. James S. McDonnell and the James S. McDonnell Foundation, and so many others whose contribution made the Center possible.

The Fourth of July celebration, the Festival of Festivals, and the Urban Gardening Fair brought thousands and thousands of vistors to the Garden throughout the summer months.

Perhaps the most significant development of 1991 was the arrival of the Center for Plant Conservation, the world's first national effort to conserve rare and endangered plants and reintroduce those plants into natural habitats. The Center's move to the Garden creates an exciting number of possibilites for joint venturing—and in basic and applied research, in public education, in building data bases of rare and endangered plants, and in formulating new knowledge of how to preserve and reintroduce particulary valuable or interesting plant species. We welcome the Center and its Executive Director, Don Falk, to membership in the Garden's family and look forward to working together closely in the years ahead.

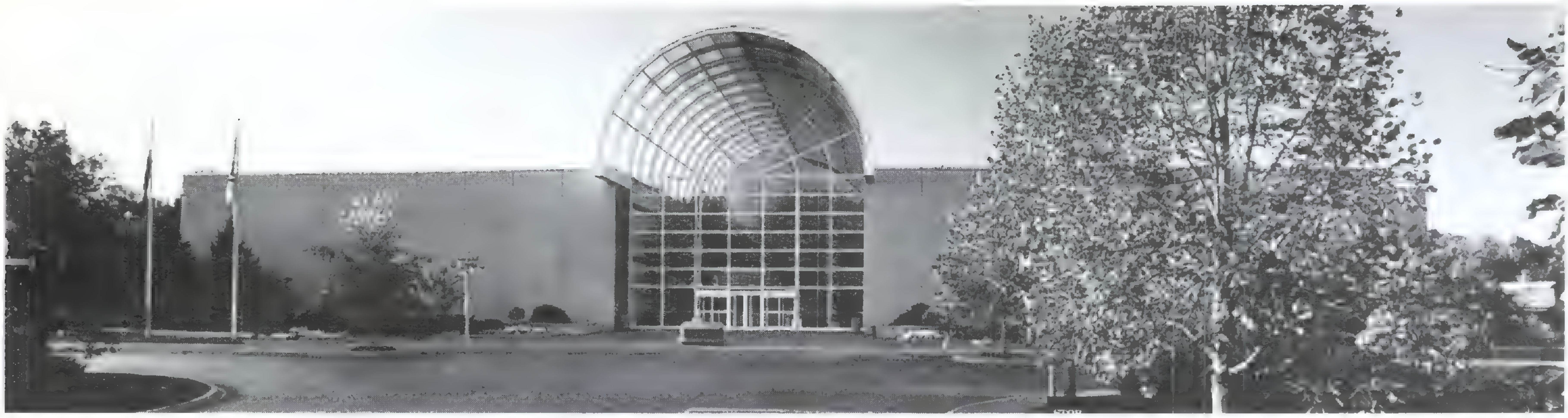
The St. Louis community and the Garden suffered a loss on May 21 of this year when Mrs. Anne Lehmann, whose 60-year deeply mutual love affair with the Garden ended when she died. No benefactor has done more to help this institution achieve greatness and she will be fondly remembered.

As we prepare for the conclusion of 1991, I ask sincerely for your continued involvement as we work together to improve our natural environment for ourselves and future generations.

Peter H. Raven

RICHARD BENKOF

TWENTY YEARS OF SERVICE HONORED—At a Garden staff meeting on August 28, 1991, Dr. Peter H. Raven was honored for his 20 years of service as director. A mound of cards, letters and congratulatory telegrams was piled on the stage of Shoenberg Auditorium, where Dr. Raven was presented with gifts from colleagues. A sculpture of a plant press, a gift from the staff, was presented to Raven by Dr. Marshall R. Crosby, assistant director (at right).



KING SCHOENFELD

Expansion Plan Withdrawn

The Missouri Botanical Garden recently presented a public proposal that involved the purchase of properties immediately north of the grounds. Our objective was to provide room to expand already crowded facilities and ensure space for future services to our members and the public, and improve access to the area.

This proposal sought to build a partnership with the community: it focused from the outset on working with our neighbors to learn if they were in agreement with the plan. If there was agreement, the Garden's plan would have offered residents a compensation package that would have been more than fair.

Our intention was to extend the $50 million investment that has been made in new facilities and programs during the last 20 years and attempt to alleviate the strains placed on the Garden by an enormous expansion in visitors, membership and public activities. After four weeks of intense public discussion and controversy, the plan was withdrawn on September 17 when it became clear that further negotiations were not in the best interest of the neighborhood or the Garden.

It was impossible to find a common ground. We believe the plan offered benefits for everyone involved. This report is designed to bring our membership and friends up to date and to outline the process that led to our decision.

The Garden—working with political leaders, civic development organizations and others—took the first step by presenting the expansion plan to the Garden's Board of Trustees for their approval. This plan was initially considered because of the unique opportunity offered to finance the project through the issuance of bank-qualified bonds available to nonprofit institutions through the Land Clearance for Redevelopment Authority, a public agency. The use of the revenue from the sale of the bonds made it possible financially to consider the expansion plan for the first time.

The Garden recognized fully that the expansion called for a thorough public process and would require the support and cooperation of many individuals and groups, especially the residents of the two blocks directly affected by the expansion.

The Garden met with the neighborhood leaders immediately after Board approval was received to learn of their interest, and the initial reaction encouraged the Garden to move ahead.

The Garden felt obligated to inform every affected owner and renter of the plan and, in order to assure that every individual learned of the plan at the same time and not through other secondary sources, a personal letter was hand delivered to each resident announcing the plan and the Garden's intention to make a fair offer to purchase their properties. Each resident was informed that the offer would include an acquisition and relocation plan, which was mailed shortly thereafter. We felt the plan was solid and generous, and offered fair market value for each property (determined by two independent appraisals) and other financial incentives for renters and owners that encouraged reinvestment in the immediate neighborhood.

The proposal was publicly announced on August 16 after all residents were informed. The Garden's Director, Peter Raven, said the plan could only work if the residents were willing to consider an offer.

Two issues of importance to the future of the Garden were addressed in the plan: accommodation of our ever-increasing visitors, who will exceed two million annually by the year 2000, and access to and from Interstate 44 through an improved ramp system presented by the City of St. Louis to the State Highway Department.

Several factors prompted the Garden to approve the expansion plan.

- Attendance at the Garden is growing at a rate of ten percent annually. In 1981, Garden attendance was 362,756: in 1990 attendance was 834,428. By 1995, attendance is estimated to be 1,343,800 and by the year 2000, the number of visitors attracted to the Garden will be 2,164,000.
- Membership has grown from 12,013 in 1980 to 29,182 as of July 1, 1991.
- Presently, the Garden can handle 545 automobiles and 14 buses. On hundreds of occasions each year the lot becomes filled to capacity. This occurs on festival weekends and during other special public and Member events and frequently on Wednesday and Saturday mornings when the Garden is free to the public.
- Safety and security are critical issues for the Garden. Elderly visitors and families with small children having to cross streets and move about in the heavy traffic conditions are at particular risk.
- Alternative expansion solutions were considered. Underground systems, high-rise garages and satellite lots did not satisfy the two primary issues of adequate accommodation of two million visitors by the year 2000, and better and more direct access to the Garden and the neighborhood through revised Interstate 44 ramps designed within the present state highway rights of way. The financial impact of alternative solutions far exceeded the proposed plan.

The investment the Garden has made in the community since 1859 has been immense. We have worked with our neighbors, civic and political leaders, individuals and corporations to strengthen our facilities and programs. This growth has resulted in adding nearly 250 new jobs to the St. Louis economy, making the Garden the largest non-polluting employer in the immediate area.

As an internationally recognized institution, the Garden will continue to offer significant benefits to St. Louisans and its many visitors from throughout the world.

No alternative expansion plan has been developed. The Garden will continue to study the problems associated with growth and attempt to find a solution that resolves these problems, and that is satisfactory to the neighborhood in which the Garden plays a major role as a neighborhood anchor, a significant educational resource, and a major tourist attraction.

Garden To Continue Work With National Cancer Institute

ON September 1, 1991 the Garden was awarded a new five-year contract with the National Cancer Institute (NCI) for the collection of plant samples in continental tropical Africa and the island of Madagascar. The Garden had just completed a similar five-year contract with NCI, collecting 7,153 plant samples from Cameroon, Central African Republic, Tanzania, Gabon, and Madagascar.

Dr. James Miller, who directs the Natural Products Research Program at the Garden, said, "This is a tremendous opportunity for our research program. We are delighted to be able to continue our collaboration with NCI, and it gives us the opportunity to expand our work in Africa. We plan to explore and collect in a number of new areas."

For many years NCI has gathered large numbers of plant samples and screened them for antitumor and AIDS-antiviral activity. Over the past 30 years NCI has developed a number of clinically active drugs derived from plants.

Before 1986, when the Garden's first contract with the agency began, most of the samples NCI tested were collected from accessible temperate areas of the world. Since 1986, the emphasis has been on collecting plants from tropical, primarily rain forest, regions. NCI works with The New York Botanical Garden collecting samples in tropical Central and South America, and with the University of Illinois and the Arnold Arboretum of Harvard University collecting in Southeast Asia.

Collecting plant samples for NCI involves enormous logistical planning, as it is no simple matter to travel to many of these remote parts of the world. Communications with remote camps are often difficult, and the volume of plant material collected creates problems of preserving and transporting the samples. Extensive coordination with local governmental and scientific institutions is critically important. Every plant sample must be identified and duplications avoided.

Drying, processing, labelling, and preparing the plant samples for transport and storage is often challenging, especially under primitive conditions at some of the remote sites. Electricity is often expensive and unavailable in some countries, and wet conditions can make sun-drying impossible. The collectors use ingenuity and resourcefulness to dry their samples, often modifying facilities and using butane, kerosene, or solar heaters to create a warm, low-humidity space in which to dry the samples.

Many people have participated in the Garden's project since 1986. Garden staff included Enrique Forero, who served as principle investigator, and Amy Pool, who was project coordinator. Duncan Thomas collected in Cameroon, J. Michael Fay in Central African Republic, Jonathan Lovett and Roy Gereau in Tanzania, Gordon McPherson in Gabon, and James Miller, George Schatz, James Zarucchi and Amy Pool collected in Madagascar. Porter P. Lowry II, who directs the Garden's overall research and conservation program in Africa and Madagascar, assisted in negotiations with Malagasy officials. The collectors collaborated with or were assisted by local personnel in each country.

W. Douglas Stevens, the Garden's director of research, said, "We are very pleased to be able to continue our work with NCI. The Garden has the opportunity to contribute its expertise to a project that promises great potential benefit to mankind."

Above, top: Malagasy graduate student Armand Randrianasolo with Amy Pool, collecting* Nepenthes madagascariensis *at Mandena near Fort-Dauphin. Center: The Garden vehicle, loaded with plant samples, at the ferry crossing near Ambilia-Lemaitso. Bottom: The port at Fort-Dauphin.

A Collecting Trip to Madagascar

From May 1 to June 14, 1991, associate curator Dr. James Zarucchi and herbarium assistant Amy Pool of the Garden's research staff collected plants for the National Cancer Institute (NCI) on the island of Madagascar. It was Jim and Amy's first trip to Madagascar, working with the Garden's program that has been active there for many years. The trip was made possible by agreements between NCI and Madagascar's Centre National de Recherches Pharmaceutiques (CNRP) and between CNRP and the Parc de Tsimbazaza, as well as the long-standing agreement between the Parc and the Garden.

Working in collaboration with Malagasy scientists, Jim and Amy's aim was to obtain the widest possible range of plant speci-

AFRICA
Gabon
N
Madagascar

MADAGASCAR continued

mens, especially endemic species, those that live nowhere else on earth. Madagascar is a biological marvel, a treasure house of unique plants and animals. It is estimated that 80 percent of the plant species in Madagascar are endemic. Many of the species on the island are severely threatened or in danger of extinction from deforestation and population pressures.

This summer's field trip concentrated on the eastern and central parts of the island near the capital of Antananarivo, the southwest near Tulear, and the southeast near Fort-Dauphin. Many of the forest areas where samples were collected had been heavily disturbed, but still contained many extraordinary plants.

The trip yielded approximately 1,500 pounds of dried plant material, enough to fill a minivan. This huge volume of samples was processed and labeled at the CNRP facilities. Low temperature drying was accomplished with a solar assisted forced air flow system.

"This was my first field trip," said Amy, who has worked at the Garden for ten years. "As project coordinator for the NCI project, I have been maintaining the computer database with field reports from all of the collecting trips. It was very interesting to participate in the work first hand."

"We didn't have to camp out a lot," said Jim. "We were able to take advantage of the accommodations in various locations, which gave us much more time to collect samples."

NSF and AID Support Projects in Africa

WITH the largest collection of African plants in North America, the Missouri Botanical Garden is a major center for research in African botany. Recently Garden scientists received awards to support projects in Gabon and Madagascar under a joint effort by the National Science Foundation (NSF) and the U. S. Agency for International Development (AID). Each three-year award supports research on ecosystems and species in developing countries, where the wealth of the earth's biodiversity is concentrated.

"These projects are of enormous scientific importance," said Dr. Peter H. Raven. "They will benefit the countries involved and will further the understanding of their priceless natural heritage."

Gabon

Dr. Gordon McPherson will study the plants of Lope-Okanda Game Reserve in central Gabon, a rich tropical rain forest. Gabon is a country the size of Colorado and straddles the equator on the west coast of Africa. Dense rain forest covers about 85 percent of the country. Gabon's rain forest has a species diversity comparable to Southeast Asia or tropical South America. Perhaps one third of the plant species in Gabon are endemic, growing nowhere else in the world.

Despite Gabon's rich plant diversity, its flora is inadequately understood and an insufficient number of specimens have been collected from its forests. McPherson, assisted by Gabonese botanists, will collect intensively during four three-month periods spread over two years to ensure a complete sample. The Lope-Okanda Reserve, with its central location and accessible trails, is a particularly rich representative of tropical African rain forests.

In addition to collecting and preserving plant samples, the project will provide training for Gabonese botanists. Information on the plants collected will be entered into the Garden's TROPICOS database in the field on laptop computers and used to prepare a checklist, or inventory, of the plants of the Reserve. The information will aid in the preparation of the *Flora of Gabon* begun in 1961 by the Museum of Natural History in Paris. The project will also help to develop Gabon's National Herbarium in Libreville, establishing a computer database there and improving services and facilities.

CLIFF WILLIS

Gordon McPherson

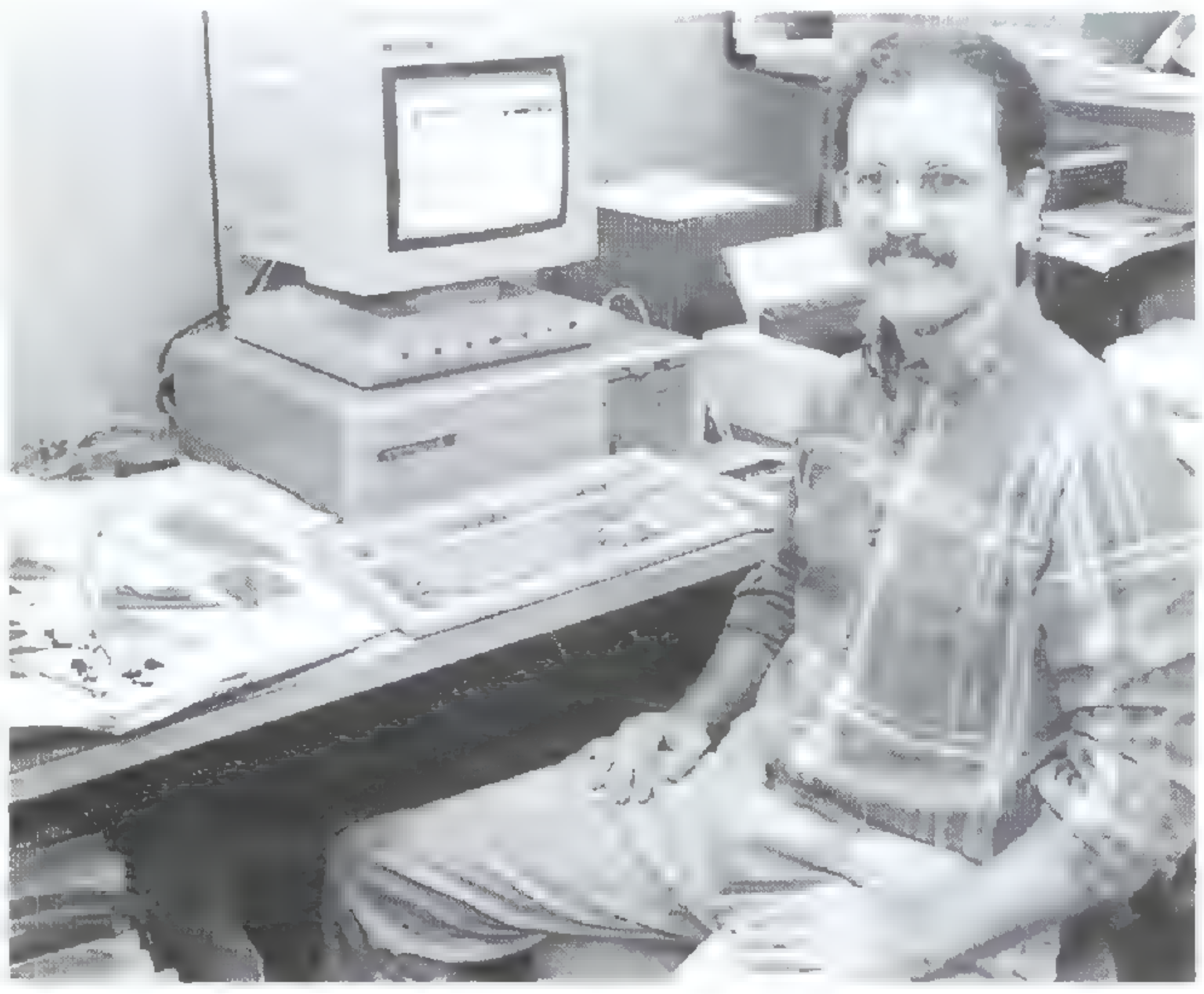
Madagascar

Dr. George E. Schatz will head the preparation of a conspectus of the vascular plants of Madagascar, an area the Garden has studied extensively for many years. Madagascar, an island off the east coast of Africa, is home to over 10,000 plant species. Schatz will be collaborating with Dr. Porter P. Lowry II, head of the Garden's Africa and Madagascar Department, and with scientists at the two Malagasy herbaria, Parc de Tsimbazaza and FO.Fl.FA. (National Center of Applied Research in Rural Development). As well as with the Museum of Natural History in Paris.

The conspectus will assemble for the first time a complete, computerized listing of all vascular plant species in Madagascar. In addition, the conspectus will compile, synthesize and summarize all known information on the flora of Madagascar, including distribution of species and their status as endangered or threatened with extinction. The conspectus will make this valuable data readily accessible, constituting a powerful tool for conservationists and government planners as well as scientists.

The information will also be valuable for the ongoing preparation of the *Flore de Madagascar*, being prepared at the Museum of Natural History in Paris under the direction of Prof. Philippe Morat, an honorary Garden Trustee.

Schatz will divide his time between St. Louis, Paris, and Madagascar. Two Malagasy technicians will be trained in the use of TROPICOS here at the Garden. They will then work to computerize the herbaria in Madagascar, creating a "living database" that can be continuously updated in the future. The Museum in Paris will also have a full time technician working on the project. Armand Randrianasolo, a Malagasy graduate student studying at the Garden, will participate in the preparation of the conspectus.


CLIFF WILLIS

George E. Schatz

RICHARD BENKOF

Participants in the Symposium (left to right): James R. Estes, National Science Foundation; Jean E. Nash, University of Utah; Theodore M. Barkley, Kansas State University; Peter H. Raven, MBG; Arlene E. Luchsinger, University of Georgia; Stanley A. Morain, University of New Mexico; Nancy R. Morin, MBG; K. W. Bridges, University of Hawaii.

38th Annual Systematics Symposium

ON October 4 and 5, 1991, 300 biologists from seven countries gathered at the Garden to discuss ''Knowledge Brokering: The Mechanics of Synthesis,'' the issues, problems, and challenges of computer-based data management systems.

The vast volume of scientific information being generated by biological research today makes old-fashioned libraries and museum collections inadequate. Data must be sorted, made easily available, and most important, synthesized in ways useful to scientists and the public. The Missouri Botanical Garden has taken a leadership role in developing relational botanical databases.

Seven papers were presented by experts from institutions that included the National Science Foundation, the Smithsonian Institution, the Garden, and universities around the country. Since 1953 the Symposium has been a driving force in systematic botany, pointing the way toward future issues and dealing with current concerns. It has been funded annually since 1954 by the National Science Foundation.

Scientists from Latin America

AS part of the active collaborative research and training programs that the Garden has with Latin American countries, several botanists have visited St. Louis during the past months. Together with the Latin American students at the Garden, they attended a dinner hosted by Dr. and Mrs. Peter H. Raven on August 19, 1991.

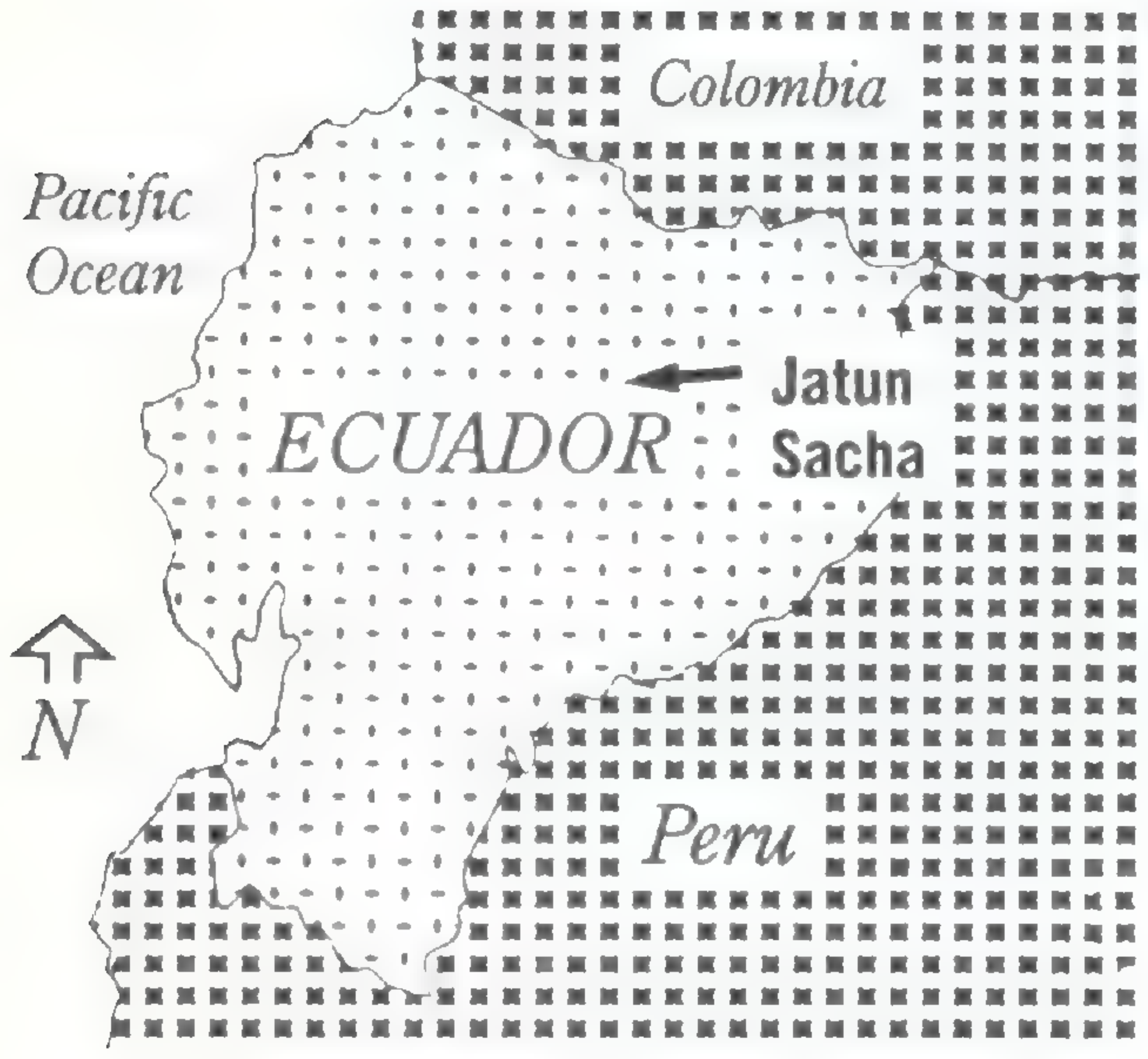
Specialists in the grass family, Poaceae, were in St. Louis to attend a planning session of the project ''Grasses of the New World.'' They were Tarciso Filgueiras, from the Instituto Brasileiro de Geografía y Estadística of Brazil, Hilda Longi-Warner from the Universidade Federal do Rio Grande do Sul of Brazil, Oscar Mathei from the Universidad de Concepción of Chile, Oscar Tovar from the Universidad Nacional Mayor de San Marcos of Peru, and Fernando Zuloaga, from the Instituto de Botánica Darwinion of Argentina. The project, which will be a cooperative effort between United States and Latin American institutions, will use TROPICOS to produce a computerized checklist of the 3,500 estimated species of grasses of the New World followed by a comprehensive flora which will have maps, illustrations and comparable descriptions.

Also attending the dinner were German Carnevali of Venezuela, Francisco Lorea of Mexico, Ivón Ramírez of Venezuela, Carlos Reynel of Peru, and Ricardo Rueda of Nicaragua, students in the Tropical Ecology Program. This is a collaborative program between the Missouri Botanical Garden and the University of Missouri-St. Louis. They will obtain their advanced degrees in different fields of tropical botany. The students live in St. Louis and travel to the tropics as part of their research program. They plan to return to their native countries after finishing their training.

Shown at the dinner (left to right): German Carnevali, Ricardo Rueda Ivón Ramírez, and Francisco Lorea.

Peter Raven (left) greets Efrain Freire, a visiting botanist from Ecuador.

UPDATE: Debt Swap Pays Off in Ecuador



David Neill

THE Missouri Botanical Garden has been actively studying the extraordinary plants of Ecuador since the 1970s. With ten percent of the world's vascular plant species growing in an area the size of Colorado, Ecuador has a concentration of biological diversity unequalled in the world. The tropical rain forests and other habitats in the country are considered by conservationists to be among the world's highest priorities for protection.

In 1989 the Garden collaborated with the World Wildlife Fund and The Nature Conservancy in the largest "debt-swap-for-nature" at that time, a transaction that benefitted Ecuador and its scientific community. The three conservation organizations assisted Ecuador to restructure $9 million of its foreign debt, converting the debt to Ecuadorean currency bonds that pay interest for eight years. The funds are reinvested in Ecuador, supporting conservation and scientific programs.

Two Garden curators, Dr. David Neill and Dr. Calaway Dodson, live and work in Ecuador supervising the Garden's research efforts and acting as advisors to Ecuador's Museum of Natural Sciences, which administers the debt swap funds. They work to promote conservation in Ecuador by helping to develop its scientific infrastructure, including training local botanists, and building and endowing institutions.

The debt swap funds have made a dramatic difference in the progress of these efforts. The National Herbarium of Ecuador, founded 15 years ago as part of the Museum of Natural Sciences in Quito, was struggling to work with little staff or equipment. With debt swap funds, plus a contract with USAID, in one year the herbarium has grown to a working collection of 50,000 mounted plants with a staff of 15 Ecuadorian botanists and foresters. The expanded staff mounts and files 2,000 specimens a month, maintains the computer databases, answers queries, and prepares publications.

All of this assists the Garden in its research. David Neill has worked for the Garden in Ecuador since 1985, and Calaway Dodson has been active there over the past 30 years. The two scientists supervise a floristic inventory project involving field studies in several regions of Ecuador, including the Amazon basin and both sides of the Andes. A staff of Ecuadorian botanists assists Neill and Dodson in the field studies.

Debt swap funds have allowed the field studies to expand into critical new areas of the Pacific slopes in northwestern Ecuador. Through an agreement with the Indian Federation, the Garden researchers will be able to collect on the Awa Indian Reserve on the border between Ecuador and Colombia, a little known and botanically important region with many species previously unknown to science. The scientists will include traditional useful and medicinal plants of the Indians in the study.

David Neill also serves as director of the Jatun Sacha Biological Field Station and Foundation, a private non-profit foundation chartered by the Ecuadorian government in 1989. Jatun Sacha, which means "Big Forest" in the Quichua Indian language, works closely with the Missouri Botanical Garden to carry out research, educational and conservation programs. The reserve of 435 hectares in the Napo province serves as a catalyst for conservation in Ecuador. It preserves tracts of primary forest, trains young Ecuadorian biologists, provides environmental education for the general public, and develops sustainable land use projects for the local rural populace.

David Neill visited St. Louis this past summer with a number of his Ecuadorian colleagues. "The progress we have made, thanks in part to the debt swap funds, is truly exciting," he said. "For a small investment, we are getting enormous rewards."

RICHARD BENKOF

Almir de Souza (left) and Wanderbilt Duarte de Barros at the Garden in August.

Delegation from Brazil

DR. Wanderbilt Duarte de Barros, director of the Rio de Janeiro Botanical Garden, along with Dr. Almir de Souza, chief administrator of that botanical garden, and Marcus de Lucena of IBM Brazil visited the Garden's extensive computer facilities August 4 to 7, 1991.

The Rio de Janeiro Botanical Garden has received assistance from IBM Brazil in building their computer capabilities and setting up a network of botanical information. The Missouri Botanical Garden is a leader in botanical information management and has relationships with botanical institutions throughout Brazil. The Brazilian delegation met with the botanical information staff at the Garden and received a general overview of the Garden's activities.

Dr. de Barros is a renowned Brazilian botanist. He has served as the general director of crop and cattle management for Brazil's Ministry of Agriculture, head of several national parks, and was several times president of the Brazilian Foundation for the Conservation of Nature, a leading conservationist organization he helped to found.

Home Gardening

Chrysanthemums

Chrysanthemums or "mums" are one of the most popular fall perennials for the garden. Numerous varieties are available today and can be selected to bloom from late summer throughout the fall.

The genus *Chrysanthemum* belongs to the daisy family and consists of over 200 species including annuals, perennials and small shrubs. Native to the Far East, chrysanthemums were introduced to America in the late 1700s. By the early 1900s hardier varieties were being grown, and with the introduction of Korean hybrids, mums became quite popular as a garden plant. These Korean hybrids became the breeding stock for most hardy chrysanthemums available today.

Garden mums are vigorous clump-type plants with strong, upright or sprawling stems that often can become woody. The leaves are slightly aromatic. Mums are quite easy to grow in the garden, but some are hardy only in mild climates and freeze when planted beyond their zone of winter tolerance. In general, chrysanthemums are short-day plants, meaning that the flowering response is triggered by the shortening days of late summer.

MUMS IN THE GARDEN

There are many places where hardy chrysanthemums can be enjoyed in the garden. Because of their shallow rooting habit, plants can be dug with a spading fork and easily moved to new locations. This is a particular advantage because mums can be grown for most of the season in a sunny location, then moved to partially shaded border areas after they have developed flower buds. They will come into full bloom and last longer because of the coolness of shade.

In the fall potted mums can be transplanted to the garden to fill in bare spots in the flower bed. Mums also lend themselves well to containers and hanging baskets, which can be moved to any sunny location around the landscape. Although they require slightly more intensive care, cascade mums present the opportunity to create a spectacular floral display. Cascades make up a group of mums which have a weeping or trailing habit. These plants can be trained to grow over wire supports, up or down fences or walls, and generate a tremendous number of blooms from a single plant.

PLANTING LOCATION

Chrysanthemums require well-drained soil and full sunlight to grow and bloom successfully. This means generally six hours of sunlight or more each day during the summer period. Plants grown with less light will become weak, spindly and produce few flowers. Avoid locations exposed to street or porch lights, as this will interfere with the flowering response to shortened days. The best location is a southeastern exposure, preferably against a foundation or wall that provides additional protection from frost. Improve the drainage before planting by elevating the bed with a good mix of garden loam and compost.

SOIL PREPARATION AND PLANTING

Any garden soil that is good for growing vegetables will be satisfactory for growing mums. For clay soils add organic matter like peat, composted leaves, rotted manure or straw to improve the drainage and aeration. Containerized plants should be planted at the same depth at which they were grown. Do not bury the root ball. This will promote a lack of root aeration and root rot caused by fungal pathogens. Chrysanthemums are shallow-rooted and do best if planted high. This means that frequent watering may be necessary during times of high heat and little rainfall. Space plants about 18 inches apart.

PINCHING

To generate a plant full of flowers and control growth, chrysanthemums require some pinching of the tips. This encourages branching and more compact growth. It also will stimulate more flower production. Pinching involves removal of about an inch of the tip of each branch or shoot. This is snapped off with the thumb and index finger. The first pinch should be done when the plant is six to eight inches tall and repeated when new branches become six inches tall. A third pinch may be necessary on fast-growing varieties. If plants are not properly pinched they will become tall, leggy, easily blown over by winds and have few flowers.

The most important thing to keep in mind is the timing of the last pinch. For early flowering varieties which bloom in mid-September, the last pinch should be around the middle of June. Varieties which flower in the early part of October should be given a last pinch on July 1. Later flowering varieties should be pinched for the last time no later than July 15. Overall, about three months is required between the last pinch and blooming.

FERTILIZATION

Most mums will require fertilization several times during the spring and summer. Fertilizing stimulates good growth, produces thick stems and maintains a healthy green color. Chrysanthemums are not heavy feeders like vegetables, so it is best to use a dilute fertilizer applied several times prior to bud set.

Nitrogen has the greatest effect on flower production and general growth. If too much is applied, vegetative growth will be hard to control, fewer flowers will be produced and flowering will occur later in the season.

Before planting a bed in the spring, about four pounds of 5-10-5 per 100 square feet can be worked into the soil to a depth of six inches. This gives about one quarter pound of nitrogen per 100 square feet. A second application around August 1 may be beneficial, especially on poorer soils. Apply about two tablespoons of 10-6-4 or four tablespoons of 5-10-5 fertilizer spread over a two foot circle at the base of the individual plants. No more than about a tenth of a pound of nitrogen should be applied at this time.

GENERAL CARE AND MAINTENANCE

During the early part of the summer, a layer of mulch material should be applied to the soil after it has warmed up. Mulching helps to conserve and regulate moisture to these shallow-rooted plants. Besides the benefits of water control, mulch protects the bed from erosion, compaction and retards weed seed germination. Use a two to three-inch layer of coarse peat, leaf mold, compost, nut hulls or lawn clippings mixed with leaves. Mulches composed of chipped wood, sawdust and straw may consume nitrogen fertilizer and rob the root system. If you use these materials as mulch, double the fertilizer applied to the bed.

If your plants become too tall and begin to drop over, then some support may be necessary. Use wire frames or upright stakes. Wire peony or tomato frames work well and should be put in place before they are needed, or they will be difficult to position without damaging the plant.

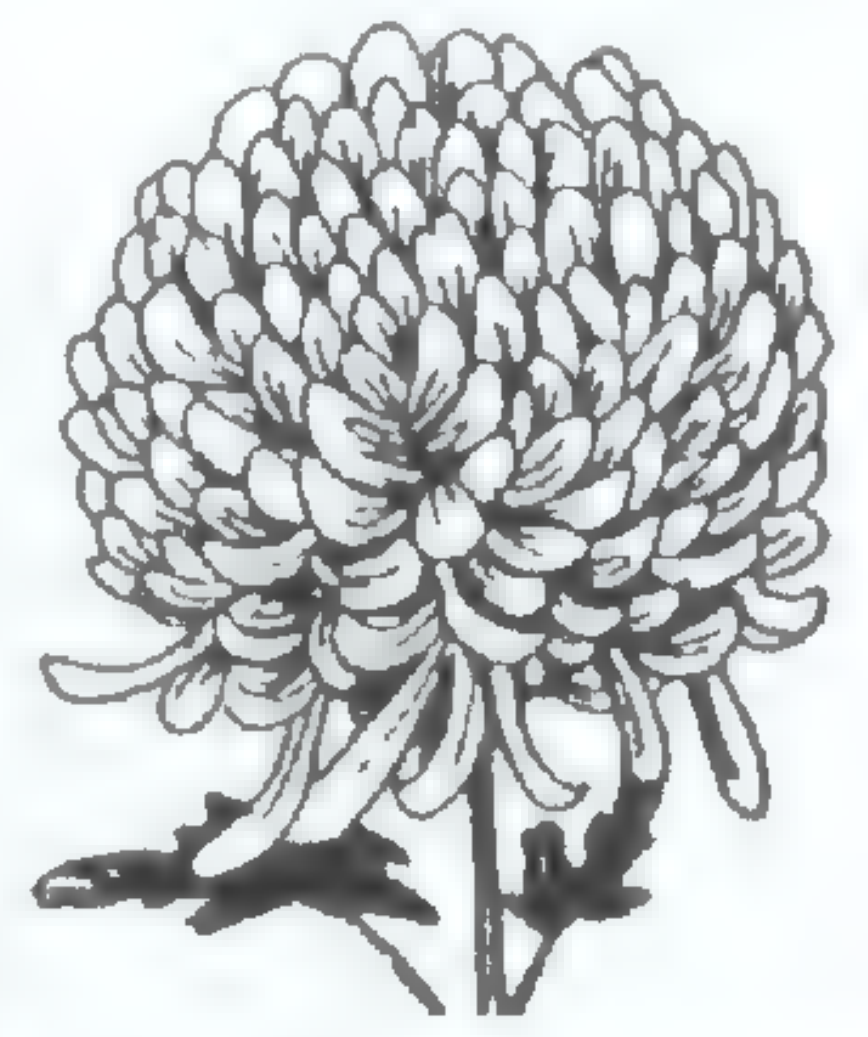
After the plants have flowered, the stems should be cut of close to the ground. Leaf, flower and stem debris should be collected and composted if they are free of diseases or insects. Infested plant debris should be composted separately.

WINTER PROTECTION

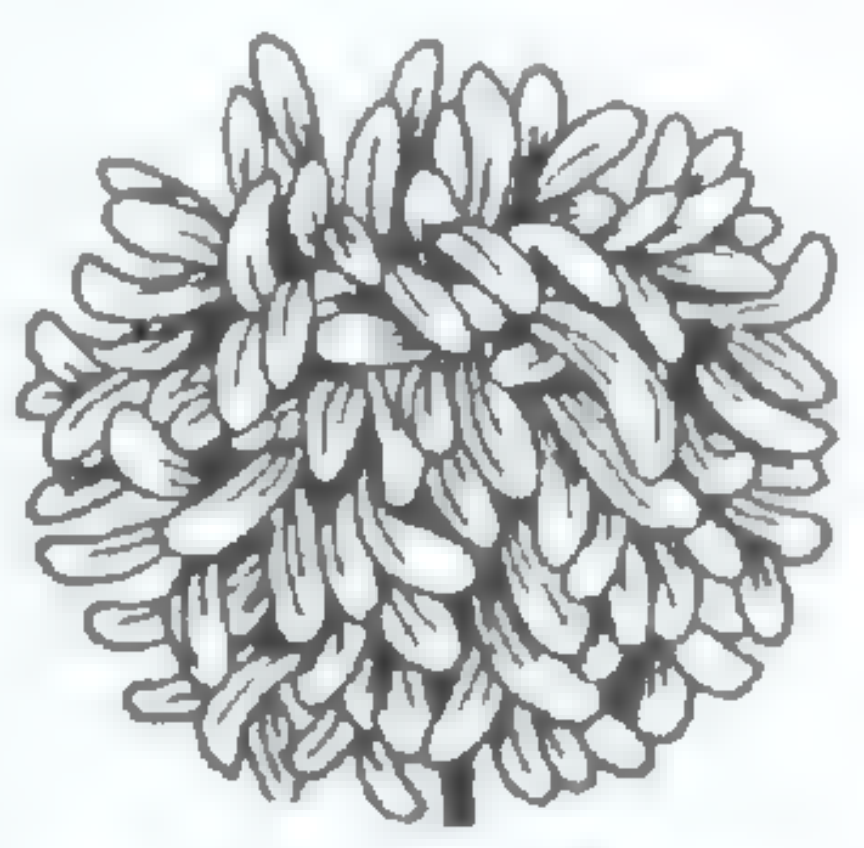
Often chrysanthemums listed in catalogs are noted as being winter hardy, meaning that the plants will survive the winter and grow the following season. Gardeners should be cautious; many mums are not reliably hardy, depending upon the climate conditions, and even

TYPES OF CHRYSANTHEMUMS

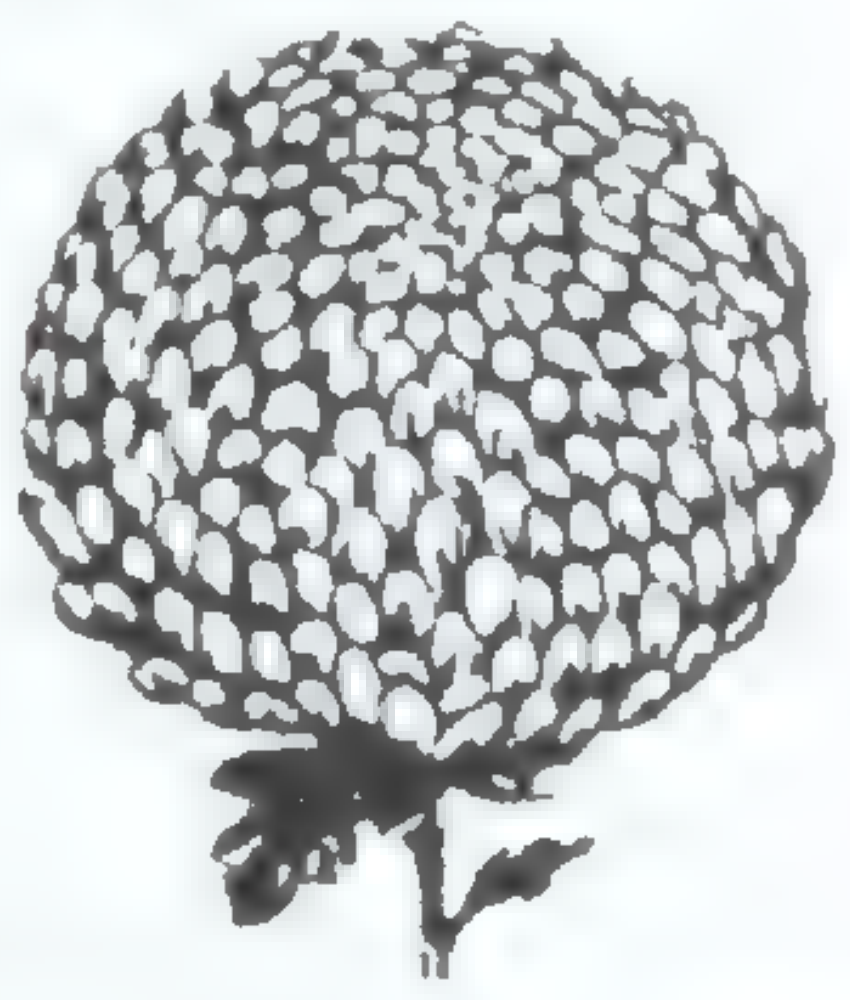
The most common method of classifying garden mums is based upon the flower form. The Chrysanthemum Society has identified 13 flower forms:



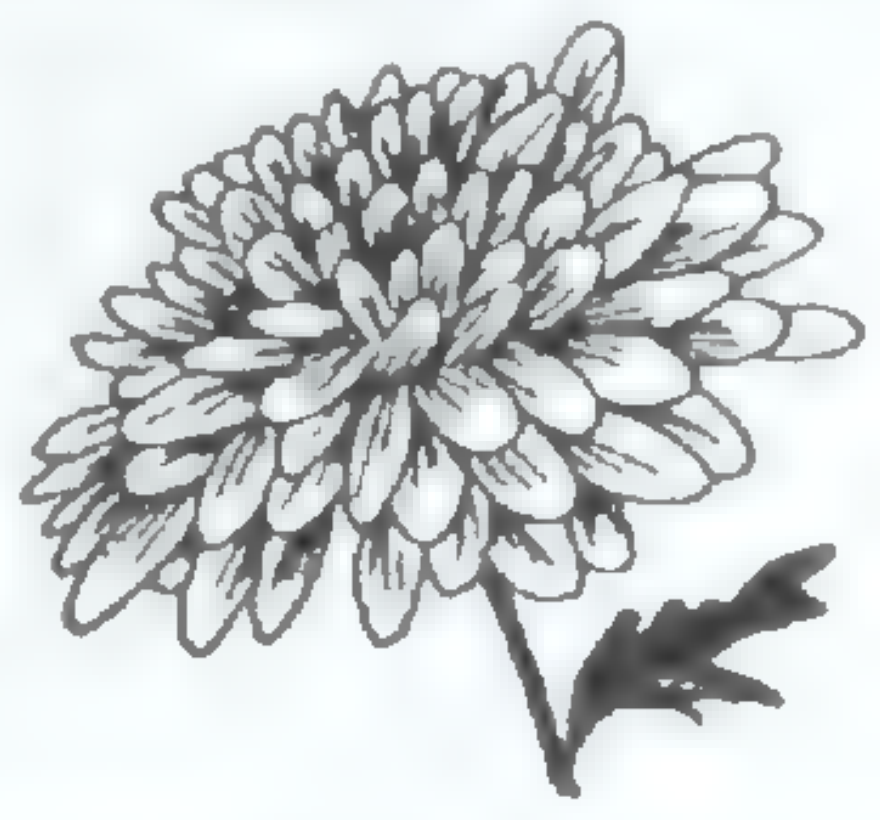
1. Irregular Incurve: Largest of mum varieties. The flower is rather loose and informal looking; the outermost petals are curved downward and drooping. (October).



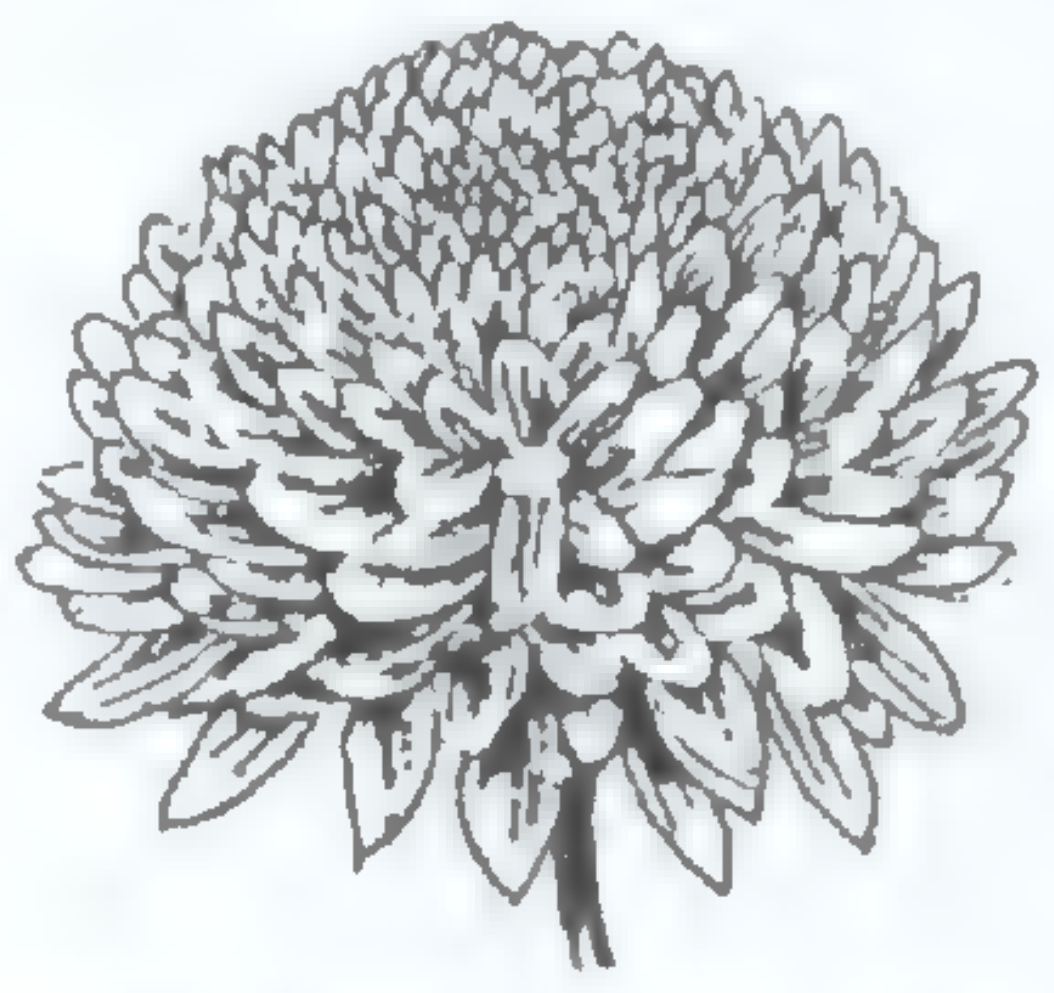
2. Reflexed: Large flowers which need to be staked. All petals fold outward away from the center of the flower; the outermost petals are curved down towards the main stem. (September to October).



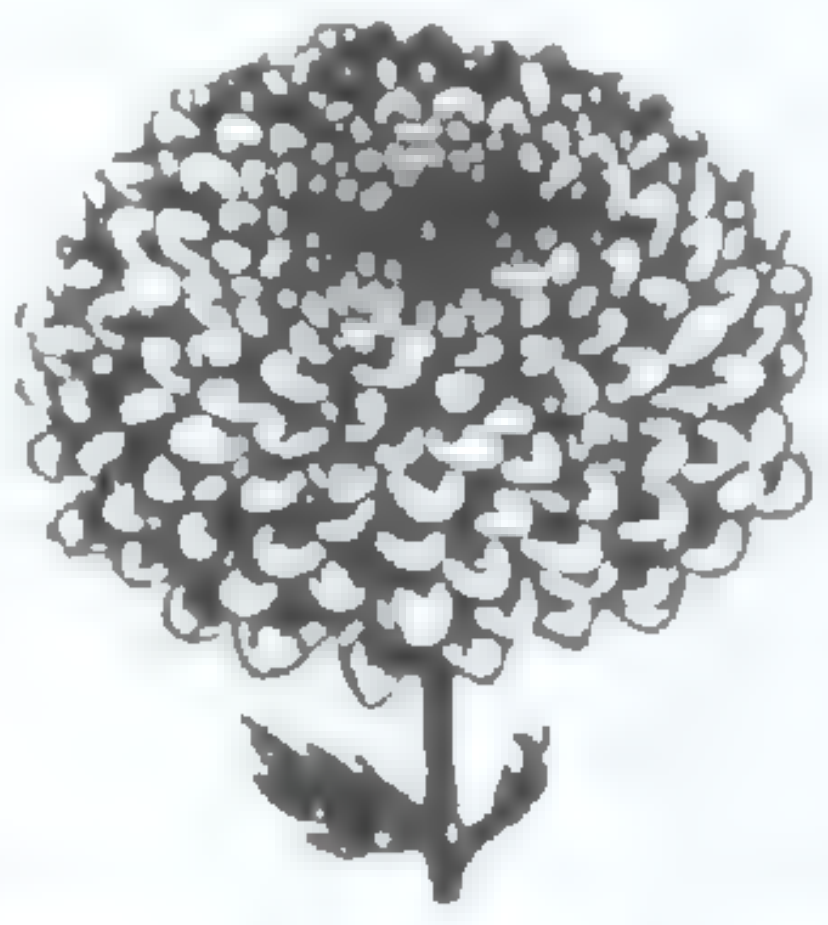
3. Regular Incurve: Sometimes referred to as a football mum. All petals fold inward towards the center keeping the head very compact. Plants may need staking. (October).



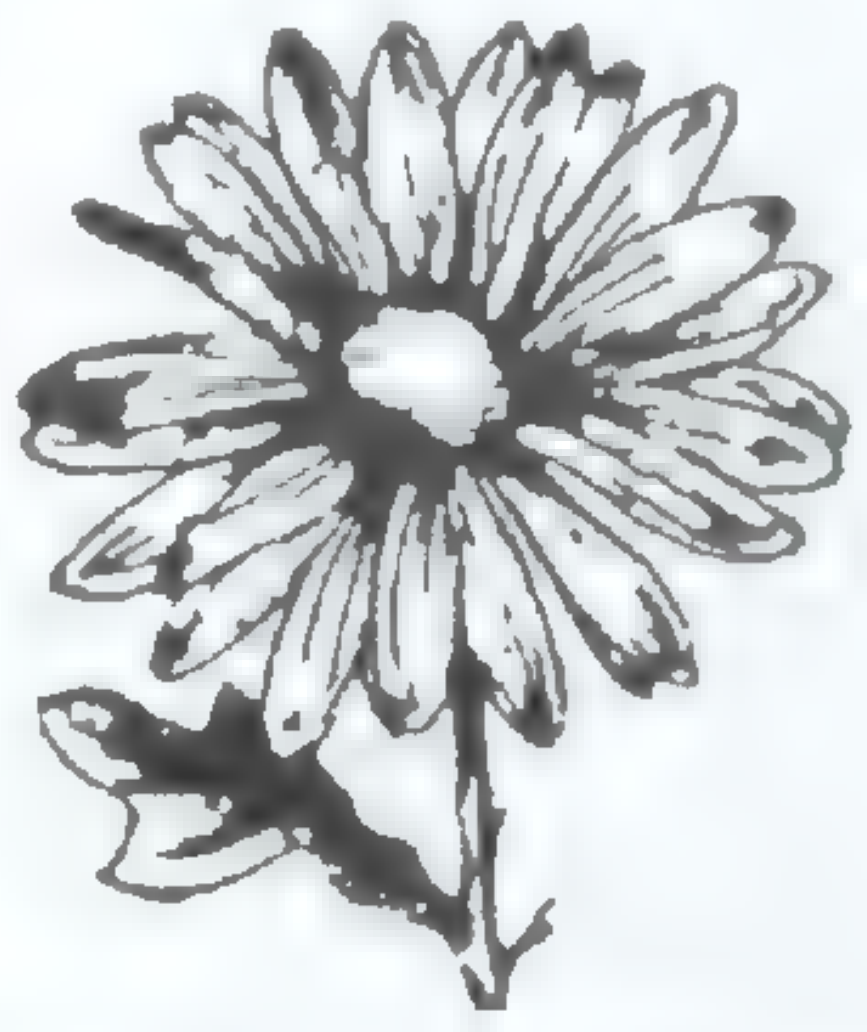
4. Decorative: Produce a flattened full flower with numerous petals most of which curve outward and slightly downward. These mums are good for cut flowers, but plants may need to be staked. (September to October).



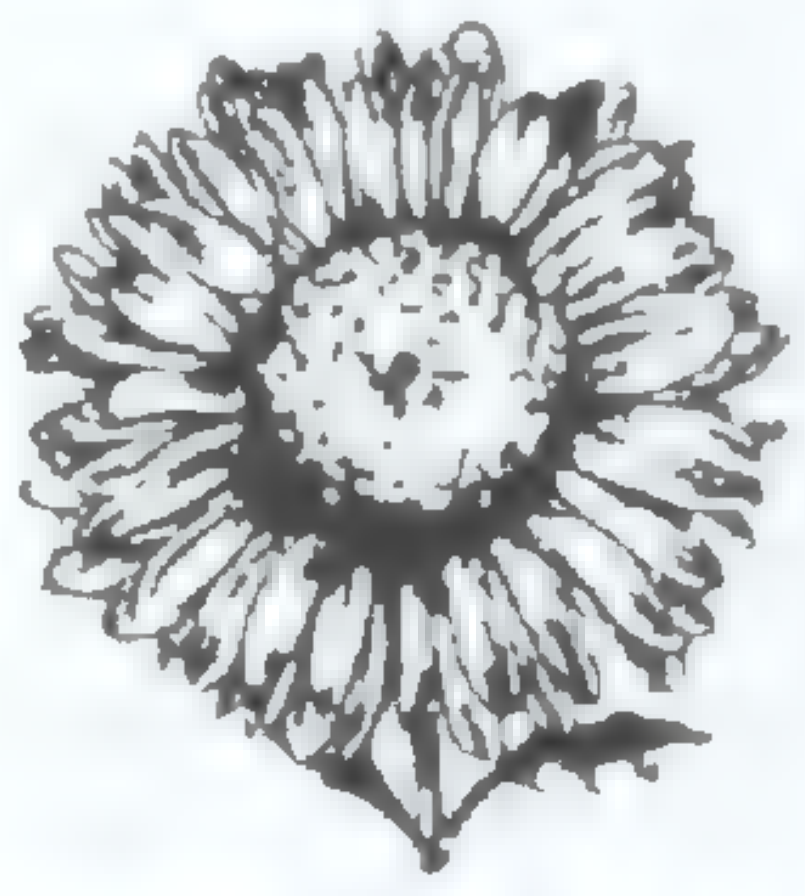
5. Intermediate Incurve: Petals remain loosely incurved towards the center of the flower head. Plants may need support. (September to October).



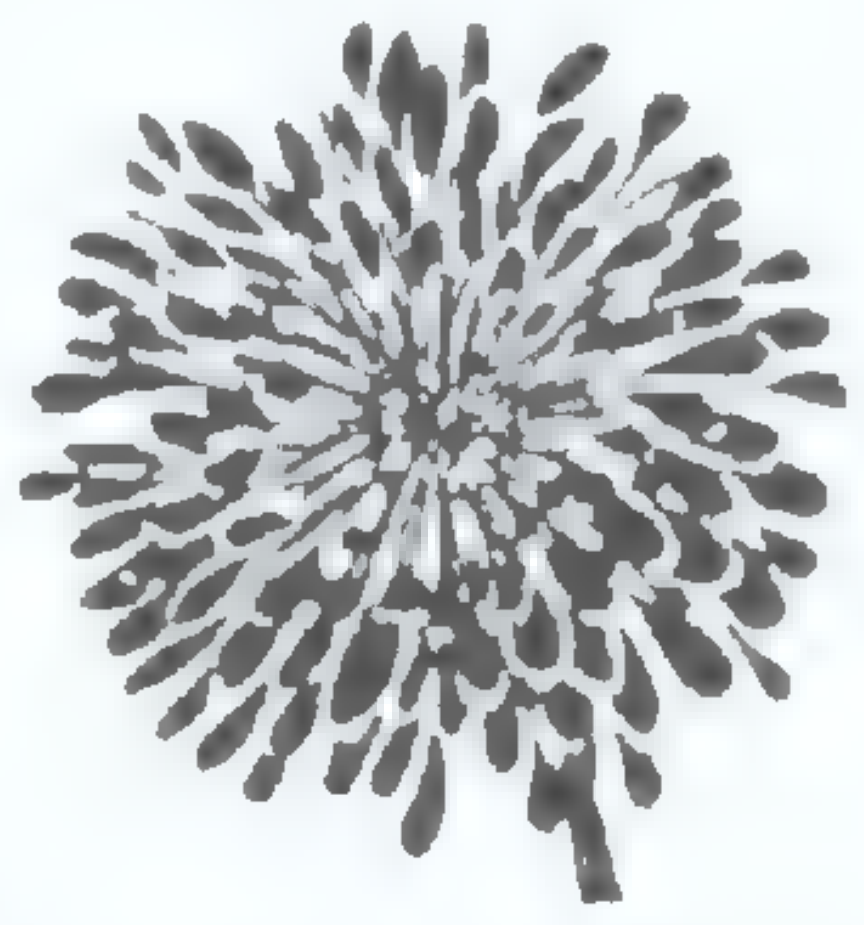
6. Pompom: Mass of flowers on each plant. Petals are short and tightly packed together to form a button or large ball. Good for cut flowers. (October).



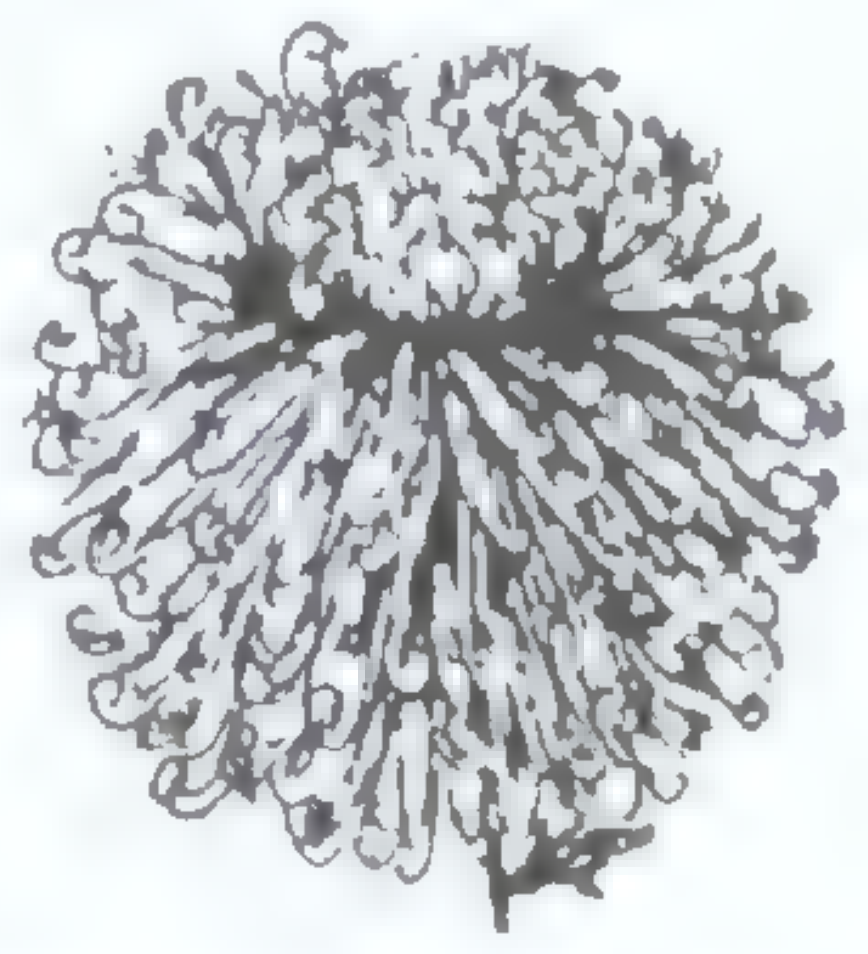
7. Single: Daisy-like blooms with several rows of long petals radiating from a flat center. (October).



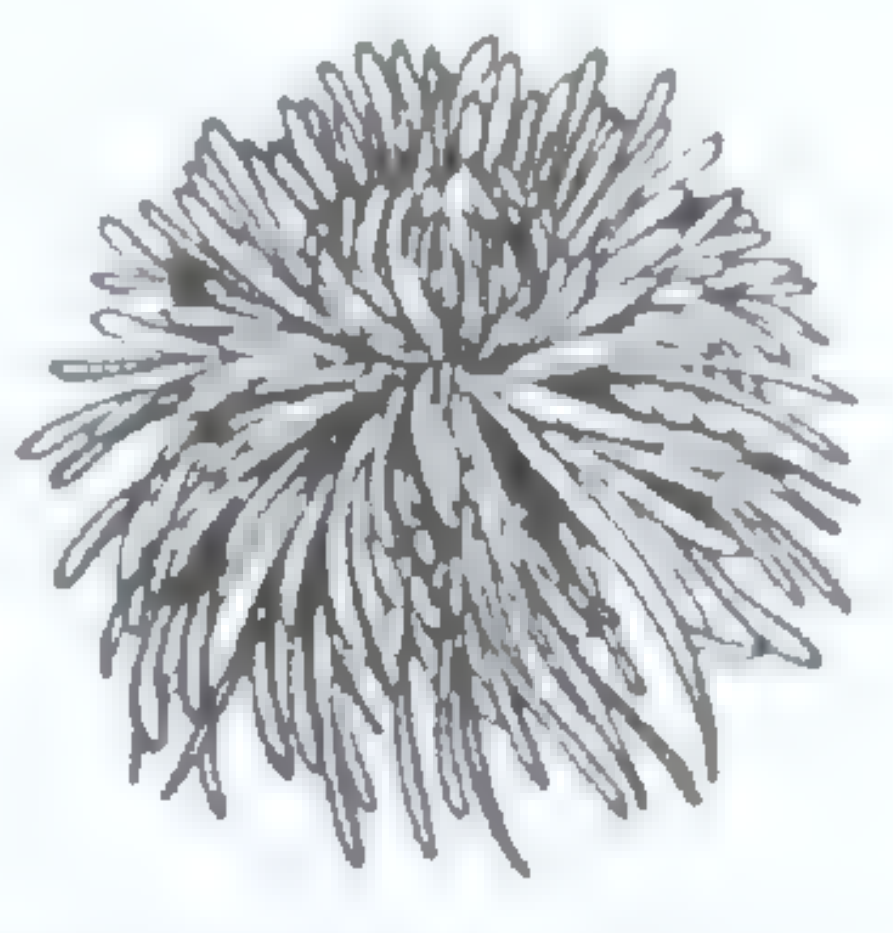
8. Anemone: Similar to a single type mum, but with long petals surrounding short deeper colored petals forming a broad center. (October).



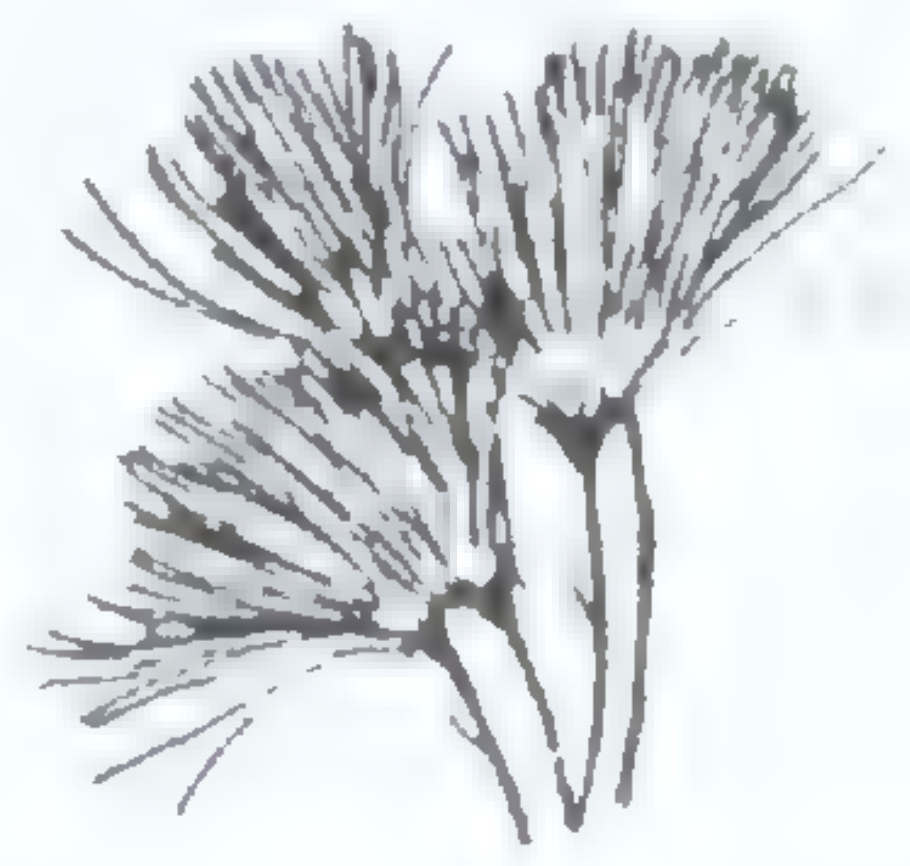
9. Spoon: A daisy-like flower with long reflexed petals curled and spoon-shaped at the ends. The center of the flower forms a flat cushion. (October).



10. Spider: Petals are long, thread-like and tubular with curled ends. The most exotic of the mum types. (October).



11. Quill: Similar to the spoon type mum except that the ends of the tubular petals are not flattened. (October).



12. Brush/Thistle: Broom-shaped flower pointing upward. Good filler for arrangements. (October).
13. Exotic: This category is for more unusual flower forms.

the hardiest varieties may not make it through the winter.

During flowering the root system will begin to grow a new set of underground shoots. These shoots, often referred to as suckers, are the parts of the plant that will overwinter and produce the next year's flowering plant. Varieties that produce many suckers and shoots are more hardy than those that produce few.

Many mum selections will survive the winter if the plants gradually become frozen and remain that way until spring. Deep snow cover will assist this and protect the frozen soil if it remains intact throughout the winter. Unfortunately, that is not characteristic of the conditions in the St. Louis area and plants must be able to stand the freezing/thawing fluctuations that typify our climate.

The best defense against adverse weather conditions is to provide good drainage so that water does not accumulate around the plants and form ice. After the first frost, mound a few shovels of soil forming an eight-inch layer around the base of each plant. Cut the branches back to ten inches above the soil line and apply a two to four-inch mulch layer as soon as the soil surface freezes. Use loosely layered evergreen branches, straw, or other lofty materials around the plants. Avoid using materials like leaves which will pack down and retard emergence of leafy shoots in the spring. After the last danger of frost has past, mulch and soil can be removed. If leafy growth has already started and the possibility of frost is still present, apply another layer of loose mulch to protect the growth.

As an alternative to overwintering plants in the bed, they can be dug and placed into cold frames. For the more tender varieties it is often the only way to keep plants from one year to another.

SELECTED CULTIVARS: GARDEN MUM OR FLORIST MUM

There are hundreds of excellent chrysanthemum varieties and the process of selection can be challenging. Often you will hear the words "garden mum" or "florist mum." These terms are used to talk about hardiness. Generally, garden mums are hardy in the areas sold. However, florist mums are not and are produced for use as a flowering indoor pot plant. Without extra protection, they will be difficult to overwinter outdoors. If you want to give a flowering mum and want to plant it outside when the flowers are past, then choose a garden mum.

PESTS AND DISEASES

Aphids, spider mites, caterpillars, leaf miners, leaf hoppers and plant bugs can challenge the mum gardener. Generally these pests can be controlled if time is taken to inspect plants for signs of feeding injury. Spider mites are perhaps the most difficult to control because their small size makes discovery of the problem dependent upon symptom development. By that time, the infestation is harder to manage.

A number of diseases plague chrysanthemums including Septoria leaf spot, powdery mildew and virus diseases. Avoiding overcrowded and shaded conditions will help in reducing the incidence of disease. Under such conditions moisture is likely to remain on the leaves providing good conditions for diseases to get started.

—Steven D. Cline, Ph.D.

Timely Tips from the Answer Service

Do you have a plant question? Call the Horticultural Answer Service, Monday through Friday, 9 a.m. to noon, at ***577-5143.***

November Tips

- Till under any unused, finished compost to improve garden soils.

- Root crops such as carrots, radishes, turnips and Jerusalem artichokes store best outdoors in the ground. Just before the ground freezes bury these crops under a deep layer of leaves or straw. Harvest as needed during winter by pulling back the protective mulch.

- Fall-tilling the vegetable garden exposes many insect pests to winter cold, reducing their numbers next year.

- Keep mulches pulled back several inches from the base of fruit trees to prevent bark injury from hungry mice and other rodents. Commercial tree guards or protective collars made of 18-inch-high hardware cloth will also prevent trunk injury from gnawing animals.

- Fallen, spoiled or mummified fruits should be cleaned up and buried.

- Newly planted broad-leaf evergreens such as azaleas, boxwoods, and hollies benefit from a burlap screen for winter wind protection. Set screen stakes in place before the ground freezes.

- Roses should be winterized after a heavy frost. Place a six to ten inch deep layer of mulch over each plant. Topsoil works best. Prune sparingly, just enough to shorten overly long canes. Climbers should not be pruned at this time.

- This is the ideal time to plant trees and shrubs. Before digging the hole, prepare the site by loosening the soil well beyond the dripline of each plant. Apply a 2″ to 3″ mulch kept several inches away from the trunk. Keep the soil moist, not wet, to the depth of the roots.

- Mulch flower and bulb beds after the ground freezes, to prevent injury to plants from frost heaving.

December Tips

- Now is a good time to collect soil samples to test for pH and nutritional levels.

- Reduce or eliminate fertilizer on house plants until spring.

- Be sure to shut off and drain any outdoor water pipes or irrigation systems that may freeze during cold weather.

- To prevent injury to turf grasses, keep leaves raked off the lawn. The leaves can be plowed under directly to enrich garden soils or allowed to decay slowly in large piles.

- A final fall application of fertilizer can be applied to bluegrass and fescue lawns now.

- Be sure the root zones of azaleas and rhododendrons are thoroughly mulched. Any organic material will do, but mulches made from oak leaves, shredded oak bark, or pine needled are preferred.

- Holiday poinsettias need sunlight for at least half the day. The soil should dry only slightly between thorough waterings. Discard the drainage. Be sure to punch holes in decorative foil wraps to prevent soggy conditions.

- On cold nights, move houseplants back from icy windows to prevent chilling injury.

- Water houseplants with tepid water. Cold tap water may shock plants.

—Chip Tynan, The Answer Service

Corporate Philanthropy Profile

The Southwestern Bell Foundation

In 1984, the Southwestern Bell Corporation, one of this country's most dynamic utilities in the fields of telecommunications and information technologies/services, formed the Southwestern Bell Foundation. Through support for tax-exempt organizations addressing education, economic development, social needs and culture, the Foundation strives to improve quality of life in communities served by Southwestern Bell Corporation companies. Most of its support is focused on the Corporation's core region of Arkansas, Kansas, Missouri, Oklahoma, and Texas.

In 1989, total charitable disbursements approached $15.6 million, including more than $750,000 to match employee and retiree contributions to educational and cultural institutions. The Foundation emphasizes education, community economic development, health and welfare, and culture. Special areas of interest include restructuring public education, teacher education, stimulating local economies through business retention and expansion, and expanding public access to arts and culture.

"In making our grants, we are project-specific and guided by a number of criteria," noted Larry J. Alexander, the Foundation's President. "Our key focus areas are education and community economic development.

"In education, we concentrate our efforts on programs that emphasize student participation in the learning process. Students must learn to think, not just repeat what they have been told. Of course, for this to be successful there also must be new teaching methods, which is why we also support innovative teacher education programs.

"In economic development, we have two main thrusts: first to support existing businesses so they prosper and, second, to promote the community's quality of life. Being a good place to live is an important factor in attracting new business investment.

"Finally, we try to promote quality of life by helping to take the arts to the people through arts and crafts programs for children, professional training, broadcasting, traveling exhibits, and touring.

"To address all these issues, we are just as likely to fund a young, small organization—or even to help in establishing one—as to support a large, old, venerable institution. While we feel a deep responsibility to fund a number of United Way campaigns, we also favor projects that provide services directly."

O. Sage Wightman III, President of the Garden's Board of Trustees, adds this comment: "The Southwestern Bell Corporation and Foundation have been steadfast friends of the Garden for many years. In the last two decades, we have benefited from their support for the construction and renovation of the John S. Lehmann Building, the Ridgway Center, and several building and renovation projects completed through the recent Campaign for the Garden. The Foundation participated in our 1989 Centennial Benefit and co-sponsored our very successful "Old Fashioned Fourth" celebration this past July. Many of the Garden's members are also Bell employees, who designate close to $20,000 annually in matching gifts that support our programs and services. These generous investments ensure the Garden's continuing ability to serve growing numbers of community residents, for which we are deeply grateful."

Behind the Scenes

CLIFF WILLIS

James E. Corbin

Executive Assistant Director Named

James E. Corbin, former commander and district engineer of the U.S. Army Corps of Engineers, St. Louis District, has been selected by Dr. Peter H. Raven to serve as executive assistant director for the Missouri Botanical Garden.

The position of executive assistant director is new to the Garden. The job was created recently due to the increasing number of programs and operational growth of the institution. The executive assistant director reports to the director. Corbin's responsibilities include strategic planning and organizational structure issues. Dr. Marshall Crosby continues to serve as assistant director working with Raven and Corbin in a senior management team. A botanist and researcher, Crosby is increasingly called upon to provide additional scientific and research leadership to the Garden.

Corbin retired on August 31, 1991, from his post as commander and district engineer of the St. Louis District, U.S. Army Corps of Engineers, after an illustrious career spanning over 25 years that carried him to assignments throughout the world. He has earned the admiration and respect of conservationists throughout the Metro area and state for his work with the Corps of Engineers. The *St. Louis Post-Dispatch* has entitled Corbin the "Green Colonel" due to his commitment to environmental projects benefiting the area.

As District Engineer, he worked to develop, rehabilitate and restore our ecological infrastructure in this section of America while overseeing the construction of the largest single on-going project in the Corps and in the Mississippi Basin, the $1 billion Mel Price Lock and Dam Project. As an example of his environmental activism, he created a 1,200 acre reclaimed wetland, the Environmental Demonstration Area, adjacent to the Mel Price Project, that has won regional and national acclaim. The project entails reclaiming wetlands from farm fields and carefully populating them with appropriate wet prairie grasses and other plants to attract tremendous numbers and varieties of birds and other wildlife. The area has been featured in the *Post-Dispatch*, *Philadelphia Inquirer*, *Audubon* magazine, the *Missouri Conservationist* and will soon be featured in the *National Geographic*. Corbin also pioneered the reintroduction of endangered species such as the false aster and peregrine falcon into the area, a first such effort for the Corps.

Corbin has pioneered other significant environmental efforts such as Riverlands 2000, an attempt to manage in a proper fashion the 43,000 acres of riverlands along the Mississippi and Illinois Rivers within the St. Louis District. This area had received no attention for the 50 years prior to his arrival in St. Louis. He also aggressively moved forward with the Environmental Management Program during his tenure. On his arrival, the district had no projects completed as part of this $191 million effort. On his departure, two have been completed (Clarksville and Dresser Island) and 20 others have been started and are in some stage of completion at this time.

Corbin has made truly extraordinary contributions to improving the environment in the 27,000 square miles of Illinois and Missouri that were under his purview, and in introducing new environmentally sound policies. He has become known as one who is uniquely able to reconcile effectively the goals of the economic, conservation and environmental communities while bringing together civic and political leaders and various governmental agencies at the federal, state and local levels.

Corbin has been recently honored by the Missouri Conservation Federation as Conservationist of the Year and by the Audubon Society. On August 15, 1991 he received the Greensfelder Medal, the Missouri Botanical Garden's highest honor for commitment and service to conservation. "I am delighted to become a part of this world-class institution," said Corbin. "I fully support the superb work done by Dr. Raven and his staff here in St. Louis and around the world. I believe I can help advance the Garden's horticulture, research and educational programs that serve so many people in so many ways."

Corbin earned a bachelor's degree in civil engineering from the University of Washington in 1966 and a master's degree in civil engineering from Stanford University in 1971. He and his wife Judy are the parents of three children.

W. Douglas Stevens

New Director of Research

On September 12, 1991, the Garden announced the appointment of Dr. Warren Douglas Stevens as director of research. Dr. Stevens succeeds Dr. Enrique Forero, who resigned.

After receiving his Ph.D. from Michigan State University in 1976, Dr. Stevens joined the Garden staff in 1977 as the B. A. Krukoff Curator of Central American Botany and was immediately dispatched to Nicaragua to prepare the first flora of that country. He lived in Nicaragua until 1986, establishing a National Herbarium, training a group of young Nicaraguan botanists, and overseeing the first intensive botanical collections there. Since returning to St. Louis, he has continued working toward the publication of the flora, which is nearing completion. The flora, written in Spanish, describes about 7,000 species of plants.

Dr. Stevens became research department head in 1988 and is well respected for his leadership and research skills. In addition to his administrative responsibilities, Dr. Stevens has been the organizer of the Garden's Annual Systematics Symposium and served four years as secretary-treasurer of the Association for Tropical Biology. He is the current treasurer of the St. Louis-Georgetown Sister City Committee.

Dr. Raven said, "We are confident that Dr. Stevens will continue to make substantial contributions to the Garden in his new role. We salute Enrique Forero for the splendid job he did as director of research, and we look forward to continuing to work with Doug Stevens."

Missouri Botanical Garden

CALENDAR OF EVENTS

November-December 1991

WALKING TOURS
Every Tuesday, Saturday and Sunday 1:00 p.m.

Join the Garden Guides for a tour of the grounds, featuring the art, architecture, history and horticulture of the Garden. Meet at the ticket counter in the Ridgway Center. Free with regular Garden admission.

Kemper Center for Home Gardening

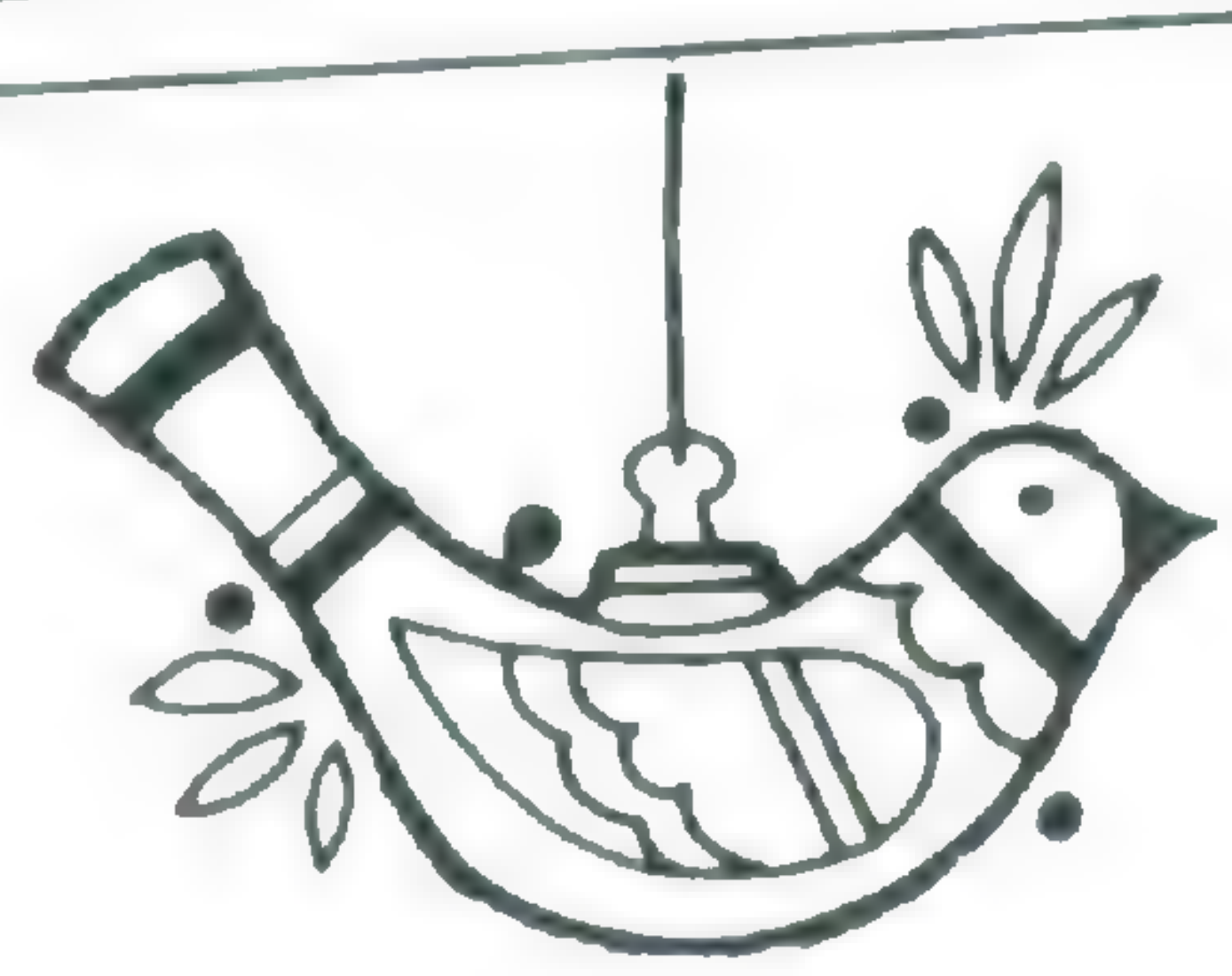
Open 10 a.m. to 4 p.m. daily. Plant Doctor available 10 a.m. to noon and 1 to 3 p.m. Monday through Saturday. Free with regular Garden admission.

Tower Grove House Tea Room

Open for luncheon Monday through Friday, 11:30 a.m. to 1 p.m., February through November, plus special Holiday Luncheons in December; advance reservations only. Call 577-5150.

Garden Walkers' Breakfast

7 to 10:30 a.m., every Wednesday and Saturday. Restaurant and grounds open early; free admission until noon. Sponsored by the American Heart Association. Call 577-5125 for information.



NOVEMBER 9 - DECEMBER 1 Fall Flower Show

9 a.m. to 5 p.m. daily, Orthwein Floral Hall. A charming early 20th century American garden with white picket fences is filled with a glorious array of chrysanthemums, celosias, ornamental grasses, and more. *Members' Preview—see November 8.*

DECEMBER 7 - JANUARY 1 Holiday Flower Show

9 a.m. to 5 p.m. daily, Orthwein Floral Hall. A spectacular display of unusual and seasonal plants, including blue flowering coleus, nicotiana, chenille plants, polka dot plants, cyclamens, stargazer lilies, begonias, hoya wreaths, boxwoods, pink peppermint poinsettias, and more. *Members' Preview—see December 6.*

NOVEMBER 14/MEMBERS' DAY Garden Greenhouses Tour

10 a.m. to 3 p.m. Continuous tours starting from Ridgway Center. Get a look behind the scenes at the beautiful plants being prepared for upcoming flower shows and next spring's plantings on the grounds. Horticulture staff will be on hand to answer your questions. Free, for members only.

DECEMBER 14/MEMBERS' DAY "The Nutcracker and the Mouse King"

11 a.m. and 2 p.m., Shoenberg Auditorium. The Imaginary Theatre Company of the Repertory Theatre of St. Louis performs a dramatic adaptation of this beloved holiday folktale. Due to limited seating, tickets are required and will be available at the Ticket Counter beginning December 11. Free, for members only.

NOVEMB

1 FRIDAY

"Spirit of the Ozarks:" Photography Exhibit

9 a.m. to 5 p.m. daily throug
December 1, Ridgway Cente
David Burt captures the natu
beauty of the Ozarks with his
ning color photographs. Free
Garden admission.

8 FRIDAY

Fall Flower Show Members' Preview

5:00 to 8:00 p.m., Ridgway C
The first flower show of the s
is a charming display of color
scent. Entertainment, cash b
Dinner buffet will be available
Gardenview Restaurant and t
Garden Gate Shop will be ope
members only.

16 SATURDAY

Deck the Halls

2:30 p.m., Shoenberg Audito
Local floral designers share i
and tips for holiday decoratin
Free, limited seating.

16-17 SATURD SUND

Best of Missouri's Hands

9 a.m. to 5 p.m., Ridgway Ce
Some of Missouri's most ski
artisans display their work fo
featuring handmade furniture
tery, toys, ornaments, and je
Sponsored by Missouri Artis
Business Development Asso
Free with Garden admission.

20 WEDNESDA

"Spirit of the Ozarks": Lec

7 p.m., Shoenberg Auditoriu
Photographer David Burt and
bers of The Nature Conserva
provide a closer look at the fl
featured in the exhibit in Mon
Hall. Free, limited seating.

23 SATURDAY

Deck the Halls

2:30 p.m., Shoenberg Audito
See November 16.

Victorian Holiday at Tower Grove House

Tower Grove House will be decorated the holidays and will be open to visitors om Tuesday, December 3, through Tuesy, December 31, (except for Christmas ay) from 10:00 a.m. to 4:30 p.m. The last ur of the day begins at 4:00 p.m.

andlelight Tour

The Ninth Annual Candlelight Tour, onsored by the Tower Grove House Auxry, will be held on Tuesday, December 3, 91, from 4:30 p.m. to 7:30 p.m. Reservans are necessary and are limited; they ay be made by mailing the form at right th your check. The fee includes a candleht tour of Tower Grove House plus freshments in the Tea Room. Enter at 45 Tower Grove Avenue, where your me will be registered. The path will be nted from there to Tower Grove House. rking is available across the street at Tower Grove Baptist Church. For additional information, please call Tower Grove House, 577-5150.

Holiday Luncheons

The Auxiliary will have special luncheons on Thursday, December 5, Friday December 6, Monday, December 9, Tuesday, December 10, Thursday, December 12, and Friday, December 13. Reservations by phone will be accepted beginning Wednesday, November 13, between 9 a.m. and 12 noon and also at the Tea Room between 9 a.m. and 11 a.m. Checks must be received no later than Wednesday, November 27. Please call 577-5150.

Tea Room

Luncheons are available by advance reservation throughout November, Monday through Friday. Please call 577-5150 to make reservations.

1991 Candlelight Tour

Please make____________reservations for the Candlelight Tour, Tuesday, December 3, 1991, at Tower Grove House between 4:30 and 7:30 p.m. Enclosed is my check for $__________, at $6.00 per person. Please make checks payable to: Tower Grove House Auxiliary. Check must be received no later than November 22, 1991.

NAME________________________

ADDRESS______________________

CITY________STATE________ZIP________

PHONE_______________________

Mail to: Tower Grove House,
P.O. Box 299, St. Louis, MO 63166

DECEMBER

UESDAY

Grove House light Tour

7:30 p.m., Tower Grove $6 per person. Reservae necessary and limited: call 0. *See above.*

HURSDAY

y Luncheon

m. to 1 p.m., Tower Grove Tea Room. Advance reserare required: please call 0. *See above.*

6 FRIDAY

Holiday Flower Show Members' Preview

5:30 to 7:30 p.m., Ridgway Center. Catch the first glimpse of the spectacular Holiday display. Entertainment, cash bar. Dinner buffet available in the Gardenview Restaurant. The Garden Gate Shop will be open. For members only.

Holiday Luncheon

11:30 a.m. to 1 p.m., Tower Grove House. *See above.*

7 SATURDAY

Christmas Celebration

11 a.m. to 4 p.m., Ridgway Center and grounds. Celebrate with Santa and enjoy other festive delights. Regular Garden admission. *See back cover.*

Deck the Halls

2:30 p.m., Shoenberg Auditorium. *See November 16.*

8 SUNDAY

Chanukah Celebration

11 a.m. to 5 p.m., Ridgway Center and grounds. Celebrate with folkdancing, lectures, storytelling, traditional kosher cooking demonstrations and more. Regular Garden admission. *See back cover.*

9 MONDAY

Holiday Luncheon

11:30 a.m. to 1 p.m., Tower Grove House. *See above.*

10 TUESDAY

Holiday Luncheon

11:30 a.m. to 1 p.m., Tower Grove House. *See above.*

12 THURSDAY

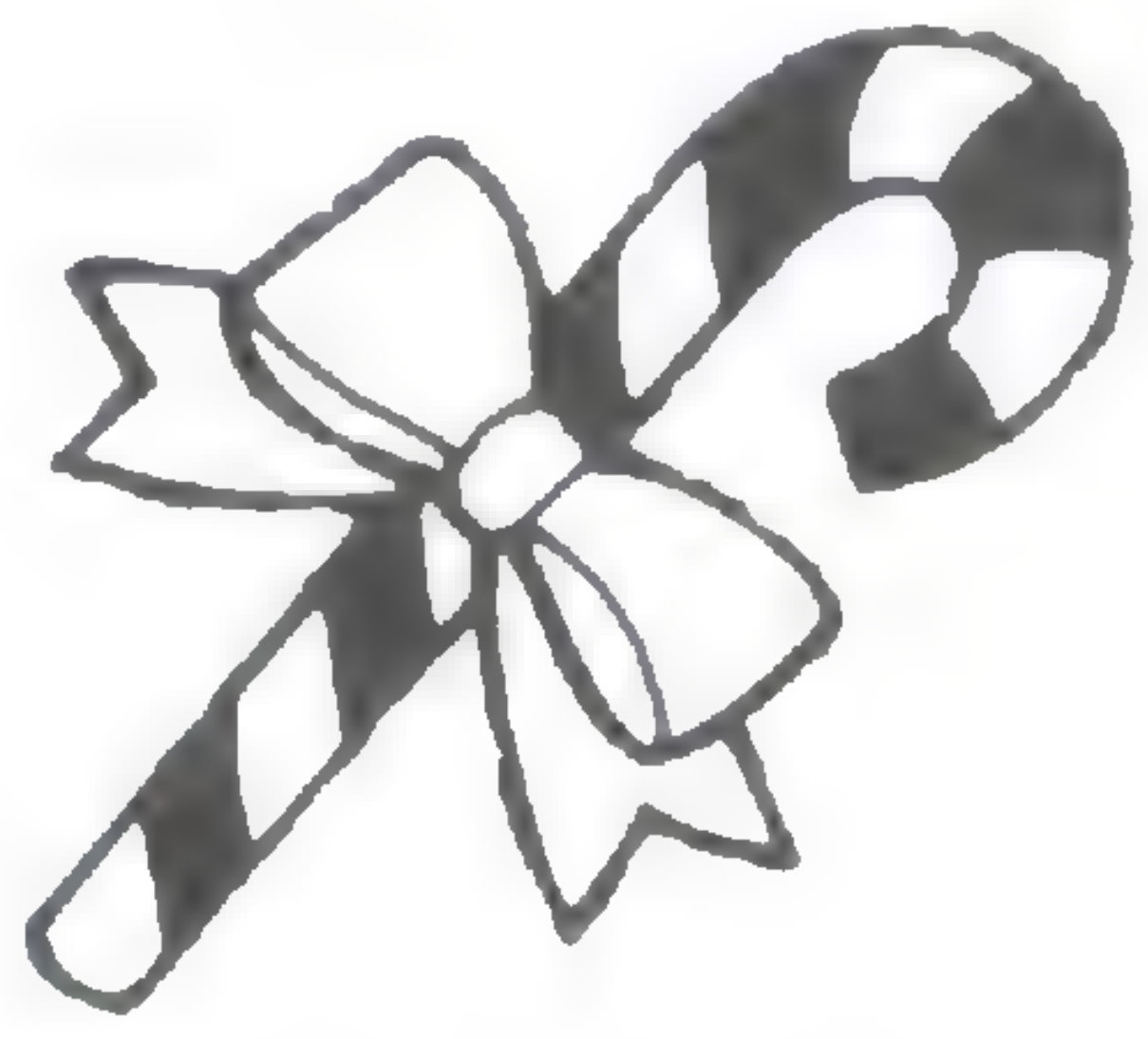
Holiday Luncheon

11:30 a.m. to 1 p.m., Tower Grove House. *See above.*

13 FRIDAY

Holiday Luncheon

11:30 a.m. to 1 p.m., Tower Grove House. *See above.*



25 WEDNESDAY

Christmas Day

The Garden is closed.

28 SATURDAY

Kwanzaa Celebration

11 a.m. to 4 p.m., Ridgway Center and grounds. Storytelling, a fashion show, craft workshops, singing, dancing and more. Regular Garden admission. *See back cover.*

From the Membership Office

1992 MEMBERS' TRAVEL PROGRAM

Gardens of Andalusia—MAY 7 TO 19, 1992

Garden Members are invited to join Mrs. Peter H. Raven and Patrick Bowe on a delightful tour of the gardens of Andalusia, Spain. This trip is specially designed by Mr. Bowe, noted Irish architect, garden designer, and garden historian, for Garden members. Mrs. Raven and Mr. Bowe will lead the tour though some of Spain's most beautiful cathedrals, palacios, castles, villas, and private gardens.

The introduction to Andalusia begins in Seville, where the terraced gardens of the Alcazar are embellished with reflecting pools and fountains in the traditional Islamic style. The group will visit the Palacio de los Duenas, home of the Duchess of Alba. The tour will travel to Cordoba for two days of exploring magnificent Moorish palaces and nearby country estates, including a visit to Palacio la Moratella at the invitation of the Duke of Segorbe. Granada is the next destination, home of the world famous Alhambra and a Generalife. The group will drive into the mountains to Ronda before journey's end, then spend two nights at the famed Marbella Club, set amidst one of the most beautiful gardens on the Costa del Sol.

We hope you will be able to participate in this exceptional and exciting garden trip. Please watch your mail for details, or call Brenda Banjak at (314) 577-9517.

A Garden Tour of China—MAY 15-31, 1992

Co-sponsored by University of Missouri-St. Louis and Missouri Botanical Garden. Details and reservation information on this tour will follow in the next *Bulletin*, or call Brenda Banjak at 577-9517.

Natural History Tours

Lewis & Clark—JUNE 12-25, 1992

Sante Fe Trail—JULY 19-27, 1992

The Garden sponsored Members' Tour to Madagascar was canceled due to the current Malagasy political situation. We are rescheduling the trip for October 1992. Please call Brenda Banjak at 577-9517 for additional information.

El Alcazar

Give the Gift that Lasts All Year

A membership in the Missouri Botanical Garden brings unlimited visits in all seasons, flower shows, members' only events, gift shop discounts, the *Bulletin* and much more. At $40 per membership, it's the easiest shopping you'll do this holiday season. Special discounts are available when you order two or more memberships:

$75 for 2 memberships
$105 for 3 memberships

Each gift recipient will be sent a limited edition Missouri Botanical Garden Christmas Tree Ornament and a holiday greeting from you. To ensure prompt delivery, please order by December 9.

Call 577-5118 and charge your gift memberships or clip and send in the application below. $21 of each $40 Membership is tax deductible. For tax information on other levels of Membership, call 577-5118.

Holiday Gift Membership Order Form—*To ensure prompt delivery, please order by December 9.*

Gift to: (Please print) Name____________________________
Address____________________________
City______________State________Zip________
Day Telephone____________________________
Gift from: Name____________________________
Address____________________________
City______________State________Zip________
Day Telephone____________________________
Please sign card:______________Date needed by:________
Regular membership: $40. Contributing membership $75.

☐ My check for $______________ is enclosed.
☐ Please charge: ☐ VISA ☐ MasterCard
Amount: $______________
Account No.______________
Name on card:______________
Expiration date:______________
Signed:______________

Make checks payable and mail to:
Missouri Botanical Garden
P.O. Box 17419
St. Louis, Missouri 63178

Call **577-5118** for more information.

From the Garden Gate Shop

Holiday Preview Sale

Wednesday, November 6:
9 a.m. to 5 p.m.
Thursday & Friday, November 7 & 8:
9 a.m. to 8 p.m.

Shop early for the holidays! Members receive a 20 percent discount on all merchandise, all three days. Refreshments will be served, and the Shop will be open during the members' preview of the Fall Flower Show.

Holiday Plant & Gift Sale

Thursday & Friday, December 5 & 6:
9 a.m. to 8 p.m.
Saturday, December 7:
9 a.m. to 5 p.m.

Fill in those last minute items on your holiday list, with a 20 percent discount for members all three days. Refreshments will be served, and the Shop will be open during the preview of the Holiday Flower Show.

Gifts Galore

The Plant Shop has kits for growing plants, a delightful gift idea. Kits include "Grow Your Own Christmas Tree," "Home Hydroponic Gardening," and children's kits with seeds for flowers and vegetable gardens.

The Shop features the finest garden tools that are sleek, functional, and beautiful; they would be cherished by any gardener, as would a weather station with clock, thermometer and hygrometer all in one.

Celebrate the season with gorgeous winter blooming camellias in red, pink, and white, or choose from a wonderful array of poinsettias, Christmas cactus, small live decorated trees, and more.

A splendid gift is the Tower Grove Rose, an exquisite sculpture created exclusively for the Garden Gate Shop by the Boehm Porcelain Studios, $175.00.

The Shop has something for everyone, with mugs, ties, wreaths, toys, T-shirts, decorations and accessories. Proceeds from the Garden Gate Shop support Garden programs and operations.

1991 Holiday Card

1991 Holiday Card

The 1991 Missouri Botanical Garden Holiday Card is on sale now. This year the card features a hand-painted photograph of the Climatron by St. Louis artist Patti Gabriel. Printed on recycled paper, the cards are shrink-wrapped 10 to a package with an extra envelope. Inside is a message from Peter Raven, director of the Garden, with the verse "Wishing you peace, joy, & a bright New Year." The cards sell for $9.50

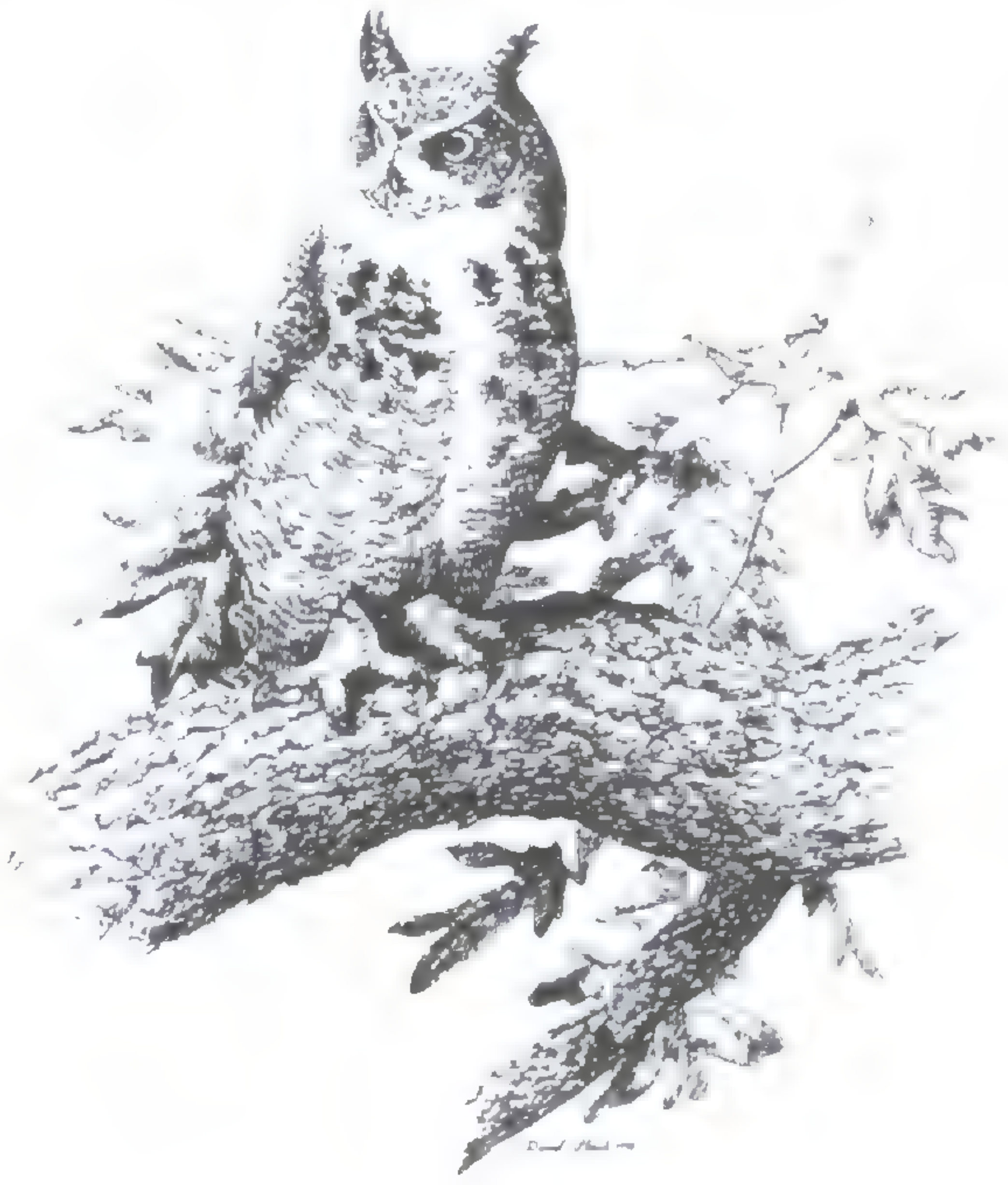
1992 Garden Calendar

The perfect gift shares the beauty of the Garden all year long. The 1992 Garden Calendar, with glorious color photographs by Jack Jennings, features a full color poster on the Garden's research on the *Araceae* family. The calendar is 16 x 12 inches, printed on recycled paper, for $10.95.

Books: *Birds of Missouri* *Their Distribution and Abundance*

by Mark B. Robbins and David A. Easterla
Illustrations by David Plank
University of Missouri Press
456 pages, available December 1991. $59.95

This beautiful book is resplendent with maps, charts, photographs and illustrations, many in full color. A treasure for all bird lovers, this landmark study is the most comprehensive treatment of birds recorded in Missouri since European settlement. It provides a historical perspective, as well as an up-to-date assessment of each species recorded in the state. It will be of special value to conservation organizations that are concerned with protecting Missouri's environment.



Master Plan Takes Shape

THIS past summer the initial phases of the Arboretum's Master Plan were put into development. The Native Plant and Wildflower Garden, a family gift of Mr. and Mrs. Blanton J. Whitmire, is under construction in an area near the 1879 Brick House. When complete, the Wildflower Garden will feature a network of trails connecting a variety of habitats, including a prairie, a glade, limestone and sandstone rock outcrop areas, a spring pool and acid seep, a small marsh and a large woodland area. These diverse areas will support a wide variety of plants, from wildflowers to shrubs and understory trees. The area will be accessible to people with disabilities.

Work has also begun on a new ten-acre nursery that will provide new plants for the Arboretum, the Garden, and Tower Grove Park. It will also provide a protected area for growing plants designated as threatened or endangered by the Center for Plant Conservation. The nursery area was made possible by the generosity of the Edward K. Love Conservation Fund.

The site of the new Native Plant and Wildflower Garden, with the Brick House in the background.

Horticulture in Missouri

The Holidays—A State Of Euphorbia

JOEL ROBERTS POINSETT would probably be surprised, and elated, to visit the Holiday Show at the Missouri Botanical Garden—or, for that matter, to attend almost any public or private function during the holiday season. As the U.S. Minister to Mexico from 1825 to 1829, Poinsett was also an avid amateur horticulturist who regularly sent unusual plants to his home country. Robert Buist, a horticulturist in Philadelphia, received one of Poinsett's Mexican plants—a brilliantly-colored *Euphorbia*; he commenced to grow, propagate, and sell the new plant, which he called "poinsettia" after its North American discoverer. The scientific name, *Euphorbia pulcherrima* (Latin for "most beautiful"), was not designated until 1836.

Although poinsettias are sold in flower shops, the colorful parts that are prized are not actually flowers. Brilliant colors are produced on leafy bracts that sit *below* the flowers. The real flowers are tiny, unisexual, and are bound together in small green bundles, or cyathia. These floral bundles are easy to identify because each has a bright yellow gland on the side that produces large quantities of nectar. In the wild, nectar from the gland attracts flies; while gathering the nutritious nectar, the flies pollinate flowers of the poinsettia.

Poinsett's original Mexican plants had bright red bracts, but pink, white, and variegated forms are now available. At the Holiday Floral Display in Orthwein Floral Hall at the Garden (see page 12), many different colors and kinds of poinsettias will be on view.

The poinsettia is a member of the spurge family, Euphorbiaceae. With over five thousand species, this family occurs in the most tropical areas of the world, as well as many temperate ones. In Missouri, we have about thirty native species in the family; one of these, the beautiful *Euphorbia marginata*, is called snow-on-the-mountain because the bracts are snowy white.

However, it is the hot, dry tropical areas of the world where the spurge family is best represented. To get a feel for the unusual diversity of this family, visit the Desert House, just south of the Climatron, and search the plant labels for the family name, Euphorbiaceae (all family names end in "-aceae"). Many spurges bear a striking resemblance to the plants in the cactus family; this resemblance is reflected in the common names, such as candelabra cactus or pencil cactus. But don't be fooled! The cactus family is quite distinct from the spurge family in many ways, for instance, in the kind of flower each produces. If you continue to browse through the Desert House, you will see many plant families represented. These species, no matter the family, tend to resemble each other by their fleshy stems or leaves, and tough or hairy exteriors—features which help conserve water. When distantly related plants come to resemble each other due to similar environmental pressures, this is called **convergence**.

The spurge family contains many economically valuable species, as well. Products such as rubber *(Hevea)* and tung oil *(Aleurites)* are produced from plants in this group, as well as castor oil, *Ricinus communis*. Familiar cultivated plants in the Euphorbiaceae include crotons, *Codiaeum* and *Croton*; chenille plant, *Acalypha*; and crown-of-thorns, *Euphorbia milii*. And, of course, the poinsettia. Happy Holidays!

—Lucile McCook, Ph.D., Horticultural Taxonomist

Garden research scientists Michael J. Huft and Gordon McPherson specialize in the study of the Euphorbiaceae. *In 1989 the Garden hosted an international conference on the family. — Editor*

Garden Hosts Parent Teacher Organization

More than 100 elementary school principals and officers of the St. Louis Parent Teacher Organization (PTO) visited the Garden on September 30 when the Education Division held an evening open house for parents and educators.

Starting with a narrated tram tour, visitors got the opportunity to see the Garden's facilities. The group then assembled in Shoenberg Auditorium where they heard a short presentation on science education at the Garden. Dr. Larry DeBuhr, education director, provided insights on the need for greater emphasis on science education in the elementary curriculum. The PTO officers and school principals were introduced to the many educational services provided by the Garden to public and private schools, as well as to parents.

"The Garden provides a great number of programs in the area of environmental education, multicultural experiences, field studies and outreach activities," said Dr. Peter H. Raven, director. "In 1991 the Education Division served more than 125,000 children and adults in a wide variety of programs."

Following the presentation in Shoenberg Auditorium the Garden hosted an Information and Activity Fair in the Beaumont Room, evening tours of the Climatron and a visit to the Stupp Teacher Resource Center. Visitors experienced hands-on exhibits and activities designed to stimulate elementary students about the sciences. Teacher resources—books, portable science equipment and activity planners—were displayed.

The Garden serves as an important educational facility for science study providing thousands of hours of instruction to children. The Garden develops and offers professional opportunities for teachers and provides quality educational programs for senior citizens, as well.

RICHARD BENKOF

Rebecca Young of the Garden's Education staff demonstrates "Mystery Boxes" to LaVaunt Maupin, principal of Lowell Elementary School.

Garden Tour Visits the Amazon

PINK and gray river dolphins bounding through the water, an iguana diving from an overhanging limb into the river, jumping fish and equatorial showers. These were just some of the highlights of the Garden's adult education tour to the Peruvian Amazon.

Explorama Lodge, located on the Amazon River two and a half hours downstream from Iquitos in the Peruvian interior, was the group's base for eight days of adventure. From there the group, led by Barbara Addelson and Glenn Kopp of the Garden's education staff, explored the surrounding virgin rain forest with expert local guides. Mornings began at first light with a boat ride to search for birds on the misty Amazon, or a walk in the rain forest. During morning and afternoon hikes the group learned about the ecology of the forest and the wide range of uses for local plants as medicines, food and construction materials. Visiting several small villages gave the group a glimpse of everyday life in the forest and along the multitude of rivers, large and small, that make up the Amazon Basin. In the evenings, after dining by kerosene lantern on exquisitely prepared local food, the group ventured out on the river in search of nocturnal birds and mammals, hiked in the forest to find the insects and amphibians whose calls enrich the night, or gathered to listen to local music.

A highlight of the trip was the group's three day excursion to a more remote campsite, located four hours from the lodge on the Napo River. Though more primitive than the lodge, accommodations at the camp were very adequate. The local flavor and the sense of truly experiencing the jungle made it everyone's favorite part of the trip. Other highlights were as individual as the participants:

Ann Case fell in love with the rain forest. "I've been in the Climatron hundreds of times," noted Ann, a volunteer Garden Guide, "but the experience of being in the tropical rain forest was utterly fantastic. The leaf cutter ants had me thoroughly captivated. I'm looking forward to the time when I can return."

For Barbara Addelson the birds were of particular interest. "The wealth and diversity of bird life is astonishing," she said. "There are almost as many species of birds in the small area we visited as there are in all of the United States."

For part of the group eight days was not enough. They travelled to the Andean highlands and Machu Picchu to experience present day life in Peru and to learn about ancient Incan society, its remarkable culture, building techniques and agriculture. "Machu Picchu, one of the world's real treasures, is not to be missed," said Glenn Kopp. "Seeing and understanding life in the economically impoverished highlands is crucial to understanding the migration pressures that continue to threaten the Peruvian rain forests. The causes of deforestation are complex and interconnected. Taking people to Third World countries to experience their natural wonders and to see how 90 percent of the world's inhabitants live is exciting. This is what Garden adult education trips are about—experiencing and learning to appreciate the diversity of life and cultures around us."

—Glenn Kopp, Adult Education Coordinator

José Sarukhán Awarded 1991 Henry Shaw Medal

DR. José Sarukhán Kermez, rector of the Universidad Nacional Autonomá de México (UNAM), received the 1991 Henry Shaw Medal at the Garden's annual Henry Shaw Dinner on October 14 at the Ritz-Carlton Hotel. Dr. Sarukhán, a renowned plant ecologist and educator, was honored for his groundbreaking scientific research on plant population biology and his role in inspiring future generations of Mexican biologists.

Since 1989, Dr. Sarukhán has served as rector of the 350,000-student university, one of the most important institutions in Mexico. UNAM is the Garden's close collaborator of the *Flora Mesoamericana* project, together with The Natural History Museum in London. *Flora Mesoamericana*, whose first volume is due to be published at the end of 1991, will describe all plants growing from southern Mexico to Panama.

Dr. Sarukhán did his graduate studies at the University College of North Wales and was one of the first researchers to apply demographic methods to the study of plant populations. His analysis of population controls of temperate grassland weeds is a landmark in the history of ecological science. He has used plant population biology to analyze the dynamics of tropical forest systems and, together with his students, has made notable contributions to evolutionary theory with his interpretations of the ecological costs and benefits of plant life cycles.

Dr. Sarukhán's influence in Mexican science extends far beyond his own research and teaching. As President of the Academia de la Investigación, director of the Instituto de Biología, as well as rector of UNAM, he has played a powerful role in strengthening science in Mexico.

"José Sarukhán is not only a world figure in botany and conservation but an important political figure in Mexico as well," says Dr. Peter H. Raven, director of the Garden. "We are delighted to bestow this honor on him."

The Henry Shaw Medal has been awarded intermittently since 1893. It honors those who have made a significant contribution to botanical research, horticulture, conservation, the Missouri Botanical Garden, or the museum community.

RICHARD BENKOF

Dr. José Sarukhán accepts the Henry Shaw Medal from O. Sage Wightman III, president of the Board of Trustees.

Henry Shaw Academy Fall 1991 Classes

The Henry Shaw Academy at the Missouri Botanical Garden offers students aged 7 to 13 many exciting ways to investigate the world around them. This unusual program is for students who are interested in exploring the world of science, ecology and natural history. As Academy students, participants can select from a variety of courses throughout the year as well as a summer science camp. These "hands on" experiences offer students opportunities to deepen their understanding and appreciation of the natural world.

Courses and activities are designed to build on science taught in area schools. The Academy strives to offer science motivated students classes that are not available in their schools, to supplement the learning that is taking place there. Our experience oriented classes are meant to be fun, exciting and fulfilling for each individual student.

The Academy will start a new program focusing upon introducing new students to HSA classes. "Bring a friend for free" is an invitation for HSA student members to bring a friend of the same age and interest to any HSA class so indicated. We look forward to seeing lots of new faces with HSA members.

HSA November and December classes are listed below. Call 577-5140 for a course brochure, and enroll soon, as class sizes are limited.

Ages 7-9:

Habitats and Herps, November 9,
9 a.m. to 12 noon.
Nature's Engineers, November 23,
10 a.m. to 1 p.m. at the Arboretum.
(Bring A Friend for Free.)

Ages 10-12:

Observing Plant Forms, November 16,
9 a.m. to 12 noon.
Bonsai for Breakfast, November 23,
9 a.m. to 12 noon.
Adventures from Dawn to Dusk, December 7; 2 p.m. to 6 p.m. at the Arboretum.
(Bring A Friend for Free.)

Ages 9-12:

"Tuesday Topics" After School Program:
Gardens of Microbes,
November 1, 19, 26; 3:30 to 5:30 p.m.

Special Wreathmaking Class for neighborhood students ages 7 to 16 years old:
December 21; 10 a.m. to 12 noon.

HSA Wreathmaking Class for All Ages,
December 14 and 21; 10 a.m. to 12 noon.

Center for Plant Conservation

Puerto Rico/Virgin Islands Task Force Meeting

by Marie M. Bruegmann,
Conservation Projects Coordinator

On September 17-19, 1991, the Puerto Rico Department of Natural Resources hosted the second Puerto Rico/Virgin Islands (PR/VI) Priority Region Task Force meeting in San Juan in cooperation with Fairchild Tropical Garden and the Center for Plant Conservation (CPC). Thirty-three people from 23 organizations working in Puerto Rico and the Virgin Islands attended the meeting, including Peggy Olwell, the CPC manager of conservation programs, and myself.

Puerto Rico is one of the five priority regions of the CPC. The varied habitats of these regions make them home to the broadest diversity of plants. For this reason, CPC is focusing on Puerto Rico, along with Florida, Texas, California, and Hawaii, for its conservation efforts.

Three of the people attending the Task Force meeting represented 130 years of combined experience in Caribbean botany: George Proctor of the Puerto Rico Department of Natural Resources, Roy Woodbury, an eminent teacher of botany, and Henri Alain Liogier of the University of Puerto Rico Botanic Garden. These distinguished scientists shared their vast store of knowledge with the next generation of Caribbean botanists at this meeting. It was also exciting to see the flow of information from botanists working in other regions to botanists who have spent more time in Puerto Rico.

The meeting reviewed the list of priority species compiled at the first PR/VI Task Force meeting in 1989 and assessed the biological priorities for rare plant species in Puerto Rico and the Virgin Islands. Of the 62 species previously identified as priority A, which could possibly go extinct within the next five years, 48 were determined to still be priority A at this meeting. Eighteen species were added to the priority A list.

Some species have become more rare since Hurricane Hugo hit the islands shortly after the last meeting in 1989. Other recurring threats to rare plants are development, mining, low plant population size, and lack of regeneration of many populations. The results of this meeting will be used to assist CPC to set priorities for adding species to the National Collection. CPC will also make recommendations to various government agencies and institutions to do more studies on the lack of regeneration of many of the plant populations and to do further surveys to determine more accurate distributions of these species.

The third day of the task force meeting was devoted to a field trip to Guajataca Gorge in the Isabela area. Here we got a wonderful view of the northern coast of Puerto Rico and saw some beautiful coastal forest on the limestone cliffs. We saw some of the important species discussed during the meeting, including *Ottoschulzia rhodoxylon*, which is no longer known to set seed.

During the trip Peggy Olwell had several meetings with local university and government institutions to work on cooperative relationships. Currently Fairchild Tropical Garden in Miami is collecting and maintaining specimens of some of the top priority Puerto Rican species for the CPC National Collection. The Center, Fairchild, and the botanists of Puerto Rico agree that this collection should be housed in Puerto Rico, and Peggy was searching for institutions to work with CPC.

The week following the meeting George Proctor and Roy Woodbury led Carol Lippencott of Fairchild Tropical Garden, Richard Moyroub of Gemini Garden, and me to locations of several priority species. We were amazed that George and Roy were able to guide us unerringly to the spots where these plants grow, although in some cases they had not visited the site for over thirty years. Of the twenty species Carol was interested in collecting for the Center's National Collection, we failed to find only three. For example, neither George nor Roy knew of a current location for *Cordia rupicola*. Our trip to Puerto Rico was a very successful meeting and collecting trip, made so by the expertise and cooperation of all the people who attended.

BARBARA PFAFFE

Mark Richardson, curator of living collections at the Australian National Botanic Gardens in Canberra, visited the Garden at the end of September as part of a tour of the U.S. On September 27 he gave a lecture at the Kemper Center on "Diversity and Conservation of the Australian Flora." Richardson is a co-founder of the new Australian Network for Plant Conservation, a national program modeled on the Center for Plant Conservation here at the Garden. Left to right: Don Falk, director of CPC; Mark Richardson; Steve Cline, manager of the Kemper Center.

Gift Planning

Estate Tax Guidebook

It is often said that only two things are certain: death and taxes. When these two are joined together, the result is estate tax. In the fall of the year, in anticipation of the year-end financial analysis that so many of us must do, the Garden tries to cover tax issues in the Heritage gift planning newsletter and in this column to assist our friends and members.

The Estate tax is a *transfer* tax imposed by the federal government on the act of transferring assets to heirs at death. This tax can range from 18 percent to an effective 60 percent of a taxable estate. (While there is an estate tax in both Missouri and Illinois, it is considered a "pick-up" tax and is included in the total amount of the federal tax as a credit, therefore it will not increase the total tax burden).

The best way to minimize the amount of estate tax, and preserve more for one's heirs, is to plan ahead carefully. Where appropriate, assets can be transferred before death, and be removed from the taxable estate. In addition, there are a number of exclusions and deductions that can be utilized within a properly drafted Will, and charitable gifts can be instrumental in reducing estate taxes.

The Garden is offering a comprehensive booklet entitled *The Estate Tax Guidebook*. This excellent publication describes the estate tax in complete yet understandable language and includes provisions that are useful to discuss with a financial advisor as one prepares an estate plan. For your free copy of the booklet, or if you would like to be on the quarterly gift planning newsletter mailing list, call Ernestina Short (314) 577-9532, or write to Missouri Botanical Garden P.O. Box 299, St. Louis, MO 63166-0299.

KING SCHOENFELD

(Left) The boulder bench in the Isabel A. Baer Garden has been temporarily removed.

The Isabel A. Baer Memorial Garden

Visitors strolling east past the Linnean House will notice a lovely new garden area just north of the Scented Garden. Given in memory of Isabel Aloe Baer by her husband, Garden Trustee Howard Baer, the new garden space and fountains were designed by Chip Reay of St. Louis in consultation with Geoff Rausch of Environmental Planning and Design, Pittsburgh.

The Baer garden is a study in contrasts. Its exquisitely proportioned space is paved with smooth French limestone in delicate bands of soft rose and blue grey. At one end a pair of natural boulders of Missouri granite provide a graceful seat overlooking the central fountain, a circular pool of bubbling, swirling water surrounding a central bowl of still water that reflects the sky. A second fountain stands at the opposite end, a tall, slim column of hand chased bronze with water sliding over its polished surface to represent the river of life. The bench and two fountains form strong symbols of the natural elements Earth, Air and Water, poised together in harmony.

Enclosed by an aerial hedge of pleached trees, azaleas, and beds of colorful annuals, the Baer garden forms a special outdoor "room" with its entrance on the central axis from the pergola. It is open to view from all sides.

"The design of this garden is meant to capture the beauty and contrasts of Mrs. Baer's personality," Chip Reay explained. "It reflects her grace and inner calm and her love of nature. It is meant to be an island of serenity amid the passing seasons."

Dr. Raven said, "Isabel Baer was a lovely person and a wonderful friend. This beautiful garden seems to embody her very special personality, and we are absolutely delighted to be able to share it with visitors to the Garden."

Tributes to Raven Support Research

This past summer Garden Trustees, led by a $350,000 three-year gift from the Dula Foundation, gave a total of $650,000 in honor of Dr. Peter H. Raven's 20th anniversary as director. This tremendous show of support pays tribute to Dr. Raven's leadership and dynamic development of the Garden as an institution serving both St. Louis and the international scientific community.

The Trustees' gift will support the development of the research database system at the Garden, including the Floras of North America and China. These landmark projects are revolutionizing the use of botanical data for scientific research, education, ecological studies, and conservation efforts throughout the world (see the *Bulletin*, September-October 1991).

O. Sage Wightman III, president of the Board of Trustees, said, "It is typical of [Peter's] foresight, energy, and devotion that the Garden has taken the lead in this effort, inspiring international respect and cooperation... I can think of no better way to honor Peter and Tamra and thank them for the many contributions they have made through the years."

Garden Honors African- American Scientist with Scholarship Program

The Garden will award a $5,000 renewable college scholarship in 1992 in honor of noted scientist Dr. Ernest E. Just. This is the first scholarship program created by the Garden. This annual program has been initiated to help local college undergraduates with their study of science.

The Just Scholarship is open to St. Louis area students. The preferred recipient will be a St. Louis African-American studying science. The award is based upon academic record and extracurricular activities pertaining to science. Undergraduates who have successfully completed their college sophomore year will be eligible for the award. The scholarship will be funded through the financial support of Daniel and Adelaide Schlafly of St. Louis. The Schlaflys have provided support to a wide array of minority education programs throughout the metropolitan community.

"Tomorrow's scientists are being educated in today's world," said Peter H. Raven, director. "The Garden wants to give to the St. Louis community something that has a positive effect on our hometown and the world. This scholarship helps a deserving student move toward the dream of someday becoming a professional within the scientific community."

Dr. Just, an African-American, was an outstanding research biologist who lived from 1883 to 1941. As a child he moved from Charleston, South Carolina to New York City. At Dartmouth College, he was inspired by a biology professor, and excelled as a student. He was the only magna cum laude graduate of his class, and was also elected to Phi Beta Kappa.

As a scientist at Howard University, Dr. Just devoted a lifetime to the study of the structure and function of cells. He wrote two major books, including *"The Biology of the Cell Surface,"* published in 1939. In addition, he published more than 60 scientific papers. Howard University has named a science building to honor the memory of Dr. Just.

In 1915, Dr. Just was awarded the Spingarn Medal, the highest award given by the NAACP to the person having done the most during the year to advance the progress of African-Americans.

Those interested in more information on the Just Scholarship should write immediately to the Scholarship Committee, Education Department, Missouri Botanical Garden, P. O. Box 299. St. Louis, Missouri 63166-0299, or call 314-577-5140.

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continued on next page

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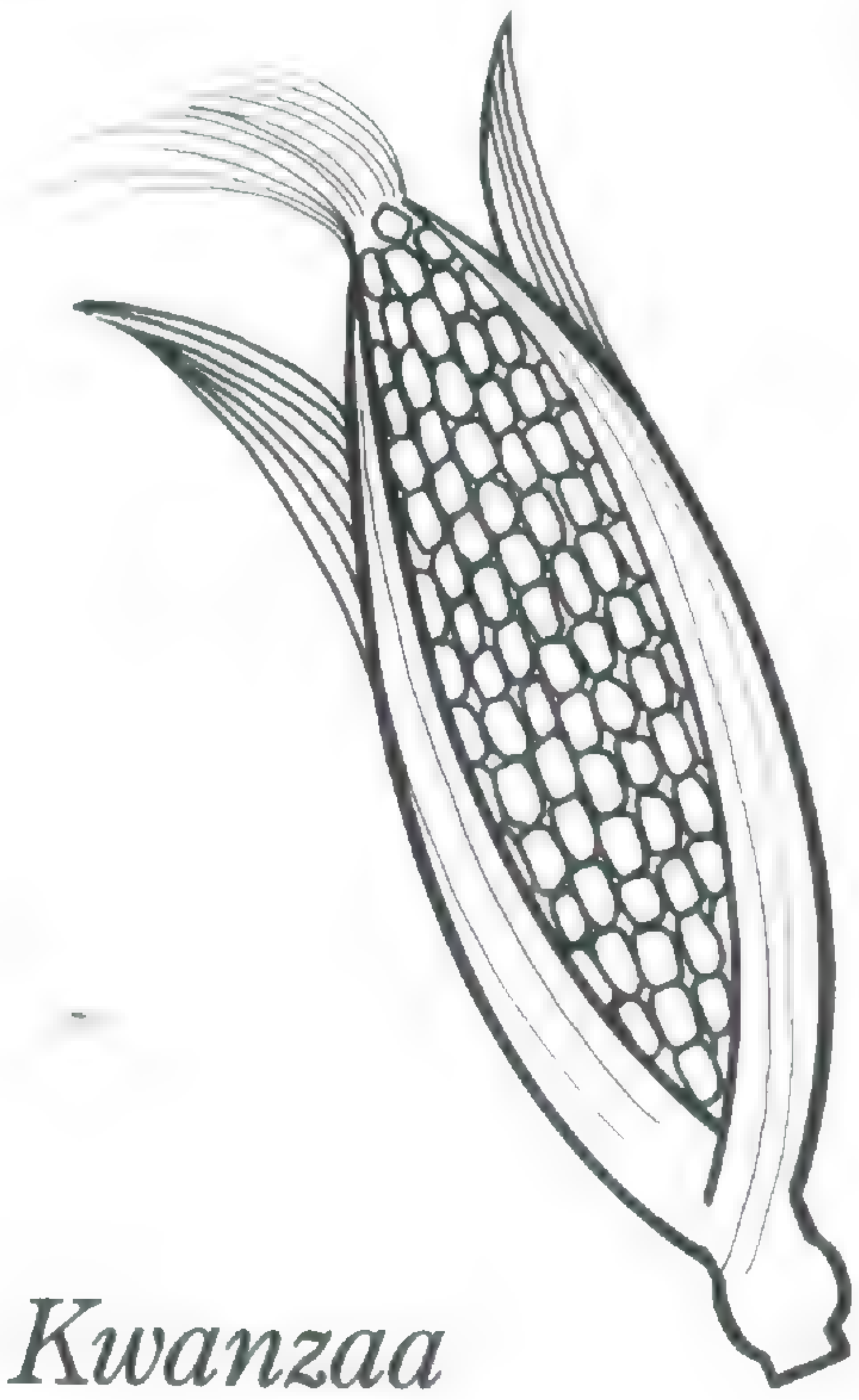
Holiday Celebrations at the Garden

Come share the joys of the season with a trio of holiday celebrations of different cultures, especially for families. Reservations are required for some workshops; call 577-5125 starting November 11.



Christmas

Saturday, December 7, 1991
11 a.m. to 4 p.m.

Santa in his sleigh will be on hand to greet visitors on the first day of the Holiday Flower Show. For a small fee have your child's picture taken with Santa at the Spink Pavilion and enjoy hot cider, cocoa and cookies. Cooking demonstrations of holiday treats, secrets for seasonal decorations from noted floral designers, the Garden Gate Shop Plant & Gift Sale, carollers and musicians, and more surprises will all be part of the holiday delights.

Chanukah

Sunday, December 8, 1991
11 a.m. to 5 p.m.

Traditional Jewish folk dancing, storytelling, music and a lecture on the meaning of Chanukah. A children's singing group will perform, and craft workshops will help youngsters create draidels and menorahs. Cooking demonstrations will feature traditional kosher foods. Co-sponsored by the Jewish Community Centers Association and the Central Agency for Jewish Education.

Kwanzaa

Saturday, December 28, 1991
11 a.m. to 4 p.m.

A ceremony and feast demonstration honor the traditions of *Kwanzaa*, from the Swahili word meaning "the first." Kwanzaa celebrates kinship, African harvest customs, and the cultural and social history of African-Americans. Storytelling, cooking demonstrations, a fashion show, children's craft workshops, dancing and singing will all be part of the celebration.

MISSOURI BOTANICAL GARDEN BULLETIN (ISSN-0026-6507)
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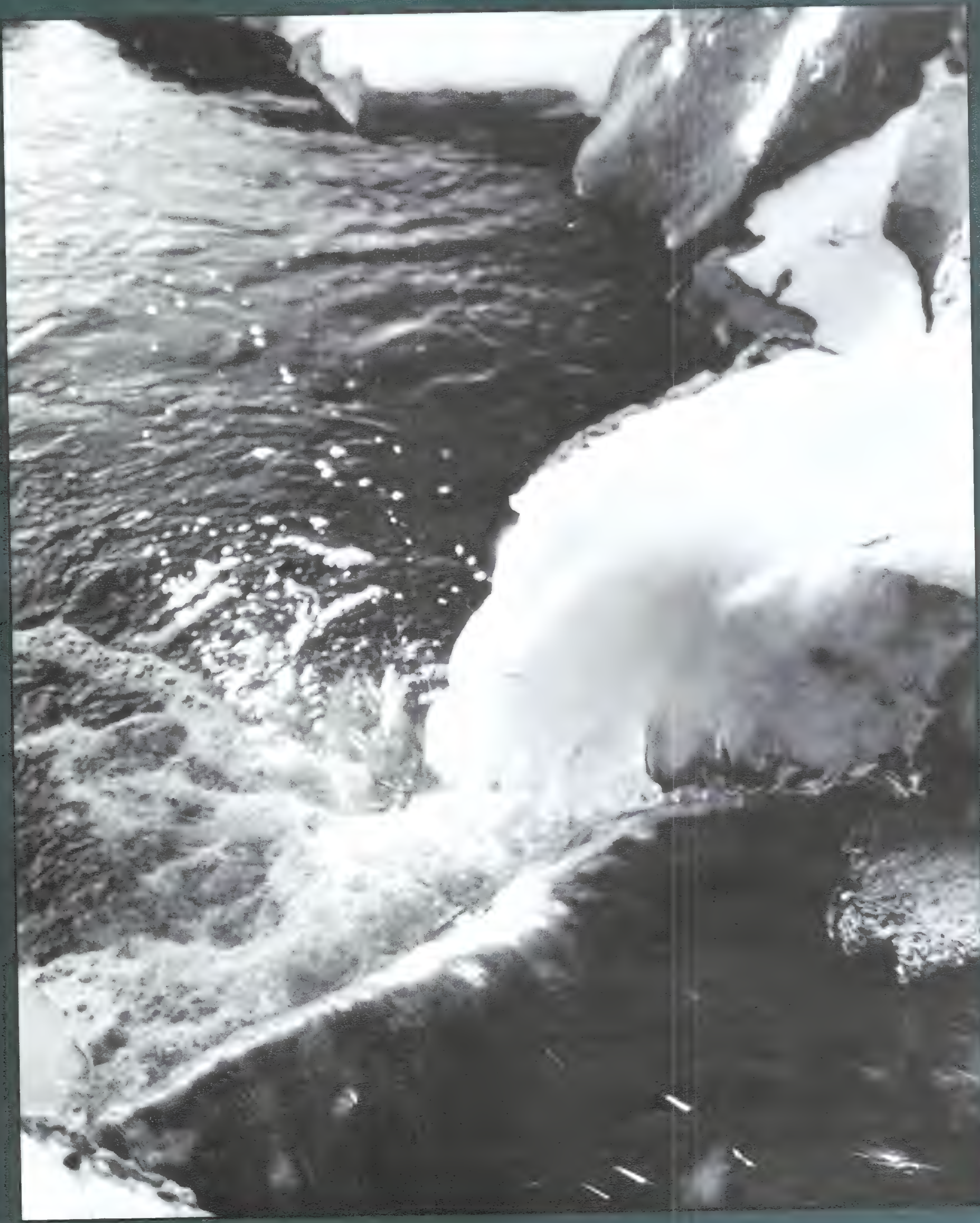

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On the cover: Winter in the Japanese Garden.
-- Photo by King Schoenfeld

1992 Missouri Botanical Garden.

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Comment

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Looking Back, Looking Ahead

As we look back over 1991, I am mindful of the excellent year the Garden enjoyed and the wonderful support we received from our many members.

During the year, the Garden's exciting role with the Center for Plant Conservation and the opening of the William T. Kemper Center for Home Gardening offered two significant examples of major strides that will certainly have a momentous impact for years to come. The interest and enthusiasm generated by these important milestones has been deeply satisfying to all of us. As this *Bulletin* goes to press, we are especially pleased to learn that the Kresge Foundation of Troy, Michigan has awarded the Garden a $500,000 challenge grant toward the renovation and expansion of facilities to house the Center for Plant Conservation and other Garden programs in a new Conservation Center building on the Garden grounds. Watch for a major story on this development in the next issue.

The opening of the Center for Home Gardening in June fulfilled years of planning. The Center is one of the most important resources in the community, and possibly one of the most comprehensive facilities in the world, for helping people to enjoy and work with plants at home. The Kemper Center served 160,000 people in its first four months of operation through its displays, library materials, diagnostic stations and personal contacts with Garden staff and volunteers. I do hope that you will have a chance to visit the Center often.

The completion of an extensive audience survey covering the entire metropolitan area represents another major accomplishment following more than a year of research. This survey has given us information about how audiences throughout St. Louis perceive us and how they choose to use their leisure time. This valuable information, utilized fully, provides a blueprint to guide us in designing and presenting activities that St. Louis residents have told us they want and would support. We have already begun to utilize the extensive data, converting it into new ideas and long term action.

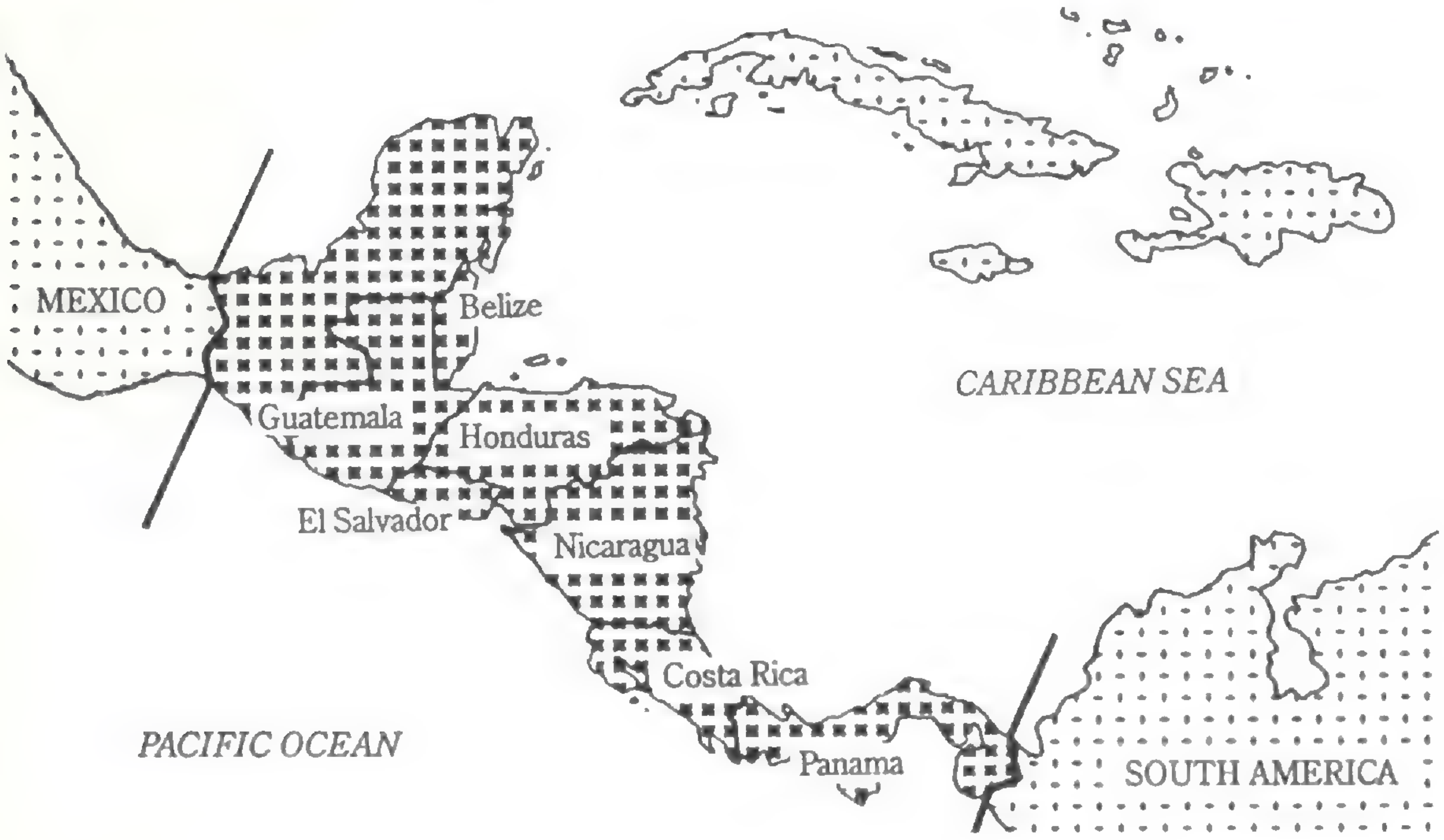
As in previous years, our membership continues to grow and as each individual supports the Garden, at any level, the Garden's ability to do more and reach more people increases. We are excited at the prospect of celebrating the enrollment of the 30,000th Garden member very soon and hope that in 1992 and beyond, we will continue to see an expanded Garden family working together to support efforts that will help resolve the environmental dilemma facing all of us.

Thank you for your continuing support and best wishes during the new year.

Peter H. Raven

CLIFF WILLIS

Ghillean T. Prance, director of the Royal Botanic Gardens, Kew (shown above, left, with Peter Raven), visited the Garden in October, 1991, for the meeting of the Board of Trustees of the International Legume Database and Information Service (ILDIS), an international project with which the Garden has been involved since 1985. During his visit Prof. Prance consulted the herbarium's holdings, especially Costa Rican collections of Chrysobalanaceae, and discovered among the materials a genus, Parinari, ***new to Costa Rica.***



A LANDMARK STUDY IN 1992

Flora Mesoamericana

TEN years in the making, the first volume of *Flora Mesoamericana*, the first major regional flora ever written in Spanish, will be published in early 1992. This ambitious project is a collaborative effort of the Missouri Botanical Garden, the National Autonomous University of Mexico and the Natural History Museum in London. It describes, for the first time, all the vascular plants growing from southern Mexico to the Panama Canal.

"The publication of this volume is extraordinarily important for the Garden and its cooperating institutions," says Dr. Peter H. Raven, director of the Garden. "Congratulations are in order to the hundreds of scientists around the world whose collaboration has made it possible."

In all, seven volumes will be published between now and the year 2000. In addition, all the information is being entered into TROPICOS, the Garden's computer database.

Flora Mesoamericana was the idea of Peter Raven, who first began promoting it in 1972. In 1980 the first organizational meeting was held, and actual work began in 1981.

Since plants pay no attention to political borders, "regional flora projects can more accurately reflect natural patterns of plant distribution than projects restricted to a single country," says Gerrit Davidse, senior curator at the Garden and co-organizer of the project.

The Central American region described in *Flora Mesoamericana* is extremely diverse and interesting. It includes not only rain forests, but dry forests, alpine areas, and grasslands as well. Researchers estimate that 18,000 plant species occur in the 800,000 square kilometer region. The project involves intensive plant collecting efforts as well as writing and editing. Since the formal initiation of the project two new plant families have been described, plus over a dozen new genera, and hundreds of new species.

One of the most interesting discoveries of the project involves a tiny threadlike plant from southern Mexico. Discovered by Esteban Martinez of the National Autonomous University of Mexico, this plant turned out to be absolutely unique among the quarter million plant species known to science. Named *Lacandonia schismatica* and classified in its own family by its discoverer, it is the only plant ever discovered in which the orientation of the sex organs is reversed; the stamen arises within several rings of pistils.

Flora Mesoamericana will provide much useful information about the plants of the region: scientific and common names, technical botanical descriptions, distributions, taxonomic notes, and identification keys.

P · R · O · F · I · L · E *Gerrit Davidse*

Flora Mesoamericana has been a long labor of love for editor and organizer Gerrit Davidse. He has been involved since the first organizational meeting in 1980, and has spent the majority of his research time since then on the project.

Davidse's major research interest is the Poaceae, or grass family, particularly tropical American grasses. The basic cereal crops are grasses: corn, rice and wheat. "Grasses are by far the most important plant family in the world," says Davidse. "Without grasses," he says without exaggeration, "human civilization would not have evolved."

In addition to *Flora Mesoamericana*, Davidse soon will become involved in a project that involves grasses exclusively. *Grasses of the New World* will provide a modern, detailed, comprehensive, computerized floristic inventory of the grasses in the Western Hemisphere. Like *Flora Mesoamericana* and many other Garden projects, it is an international collaborative effort. Seven volumes will be produced, one every year or two between 1994 and 2006. Strong emphasis will be placed on providing opportunities for Latin American grass researchers to study in the U.S., helping to train their students, and upgrading facilities at their herbaria.

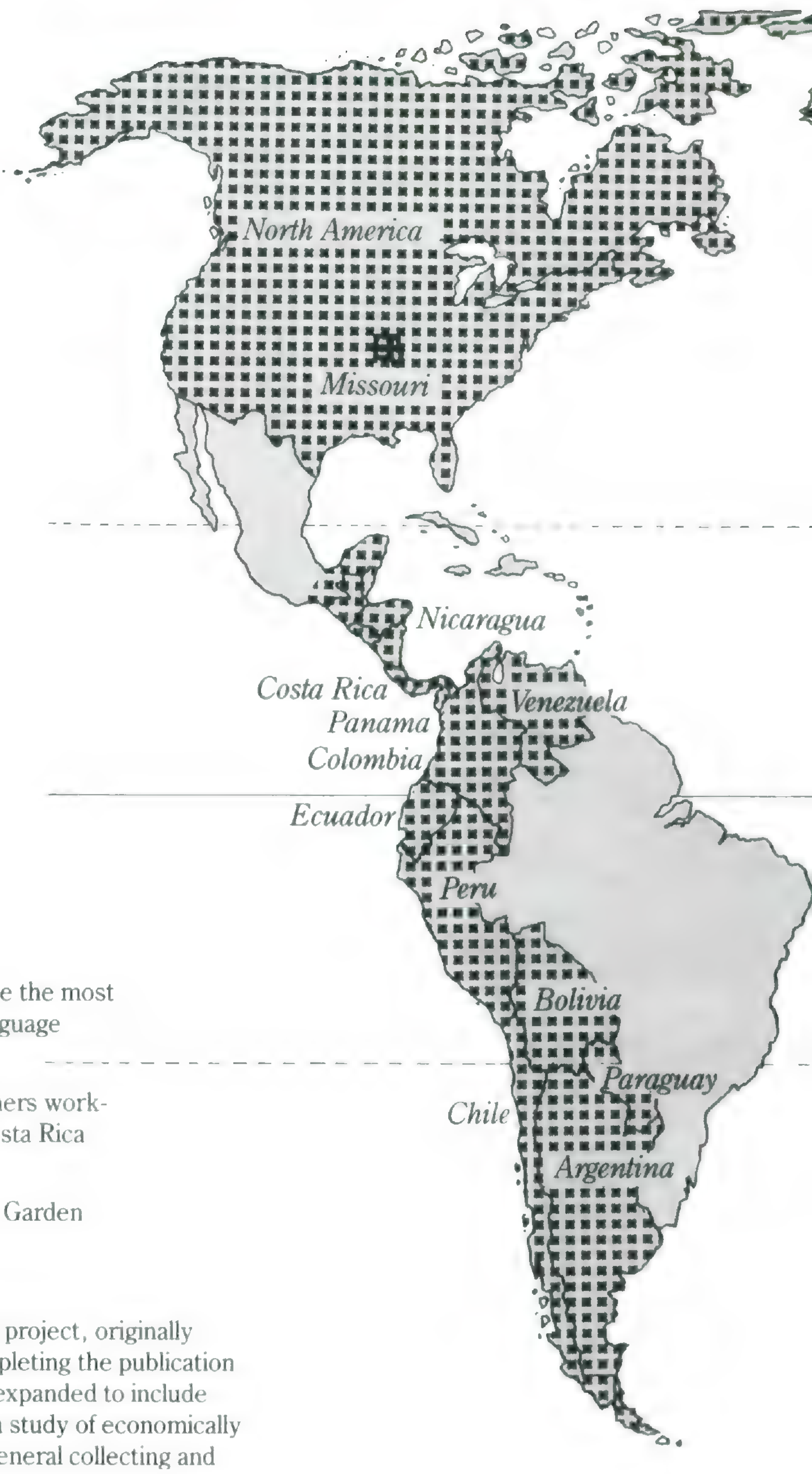
Davidse came to the Garden in 1972 after earning his Ph.D. at Iowa State University. While he spends as much time as possible researching grasses, he has had a number of other major responsibilities during his tenure at the Garden. He organized the Annual Systematics Symposium each year from 1972 to 1988. In addition, he edited the *Annals of the Missouri Botanical Garden* from 1975 to 1982. He has managed to wedge in extensive field studies as well.

After 20 years at the Garden, Davidse says, "The Garden is a vibrant institution that provides essential support for botanical research. I couldn't think of a better place to work."

Gerrit Davidse

Garden Projects Worldwide

The Garden's research division is dedicated to increasing and disseminating knowledge about plants and their vital roles in sustaining life on Earth. It concentrates primarily on learning about the many thousands of species found in rapidly disappearing tropical habitats of Africa and Latin America. This map highlights the countries in which the Garden conducts research. Without exception, the Garden's activities are performed in collaboration with local institutions in those countries.



North America

Flora of North America, with its organization center at the Garden, is a major collaborative project that will provide a long-needed synopsis of the plants of the United States and Canada. The Center for Plant Conservation, headquartered at MBG, continues its work to prevent the extinction of plants native to the U.S.

Missouri: The Flora of Missouri project is a jointly sponsored effort of the Missouri Botanical Garden and the Missouri Department of Conservation to produce a revised edition of former Garden curator Julian A. Steyermark's *Flora of Missouri*, first published in 1963.

Central America

Flora Mesoamericana, one of the most ambitious floristic projects ever undertaken (see p. 3), is an international collaborative effort of the Missouri Botanical Garden, the Universidad Nacional Autonomá de México and the Natural History Museum (British Museum) to catalog all plants of Middle America—from southern Mexico to Panama. The first volume will be published in early 1992.

Nicaragua: The Garden's comprehensive botanical inventory of Nicaragua, once the most poorly known country in Central America, is soon to be published as a Spanish-language manual.

Costa Rica: A field-oriented plant manual useful to the many biological researchers working in Costa Rica is being produced in collaboration with the Museo Nacional de Costa Rica and the Field Museum of Natural History.

Panama: Botanical exploration of Panama, the first tropical country in which the Garden conducted field research, continues with collecting trips to remote areas.

South America

Venezuela: A monumental 40-year inventory of the fascinating flora of the Guayana Highlands, or "Lost World" region, of southern Venezuela is nearing completion. Over 150 botanists outside the Missouri Botanical Garden have contributed to this project. The first two volumes are set to go to press in 1992.

Colombia: The Garden's collaboration with Colombian colleagues continues with a variety of plant collection efforts. The Garden works in mutually beneficial collaboration with institutions throughout the country. Amazonian Colombia is being studied in the Documentation of Neotropical Plant Diversity and Biogeography Project. This project, funded by the MacArthur Foundation, will establish inventory plots for further study by zoologists and ecologists after mini-floras of the sites have been written.

Ecuador: In 1989 the Garden participated in the Ecuadorian "debt for nature" swap coordinated by the Nature Conservancy, World Wildlife Fund, and the Fundación Natura of Ecuador. The Garden's portion of the debt purchase is being used to support botanical fieldwork and development of botanical institutions in Ecuador.

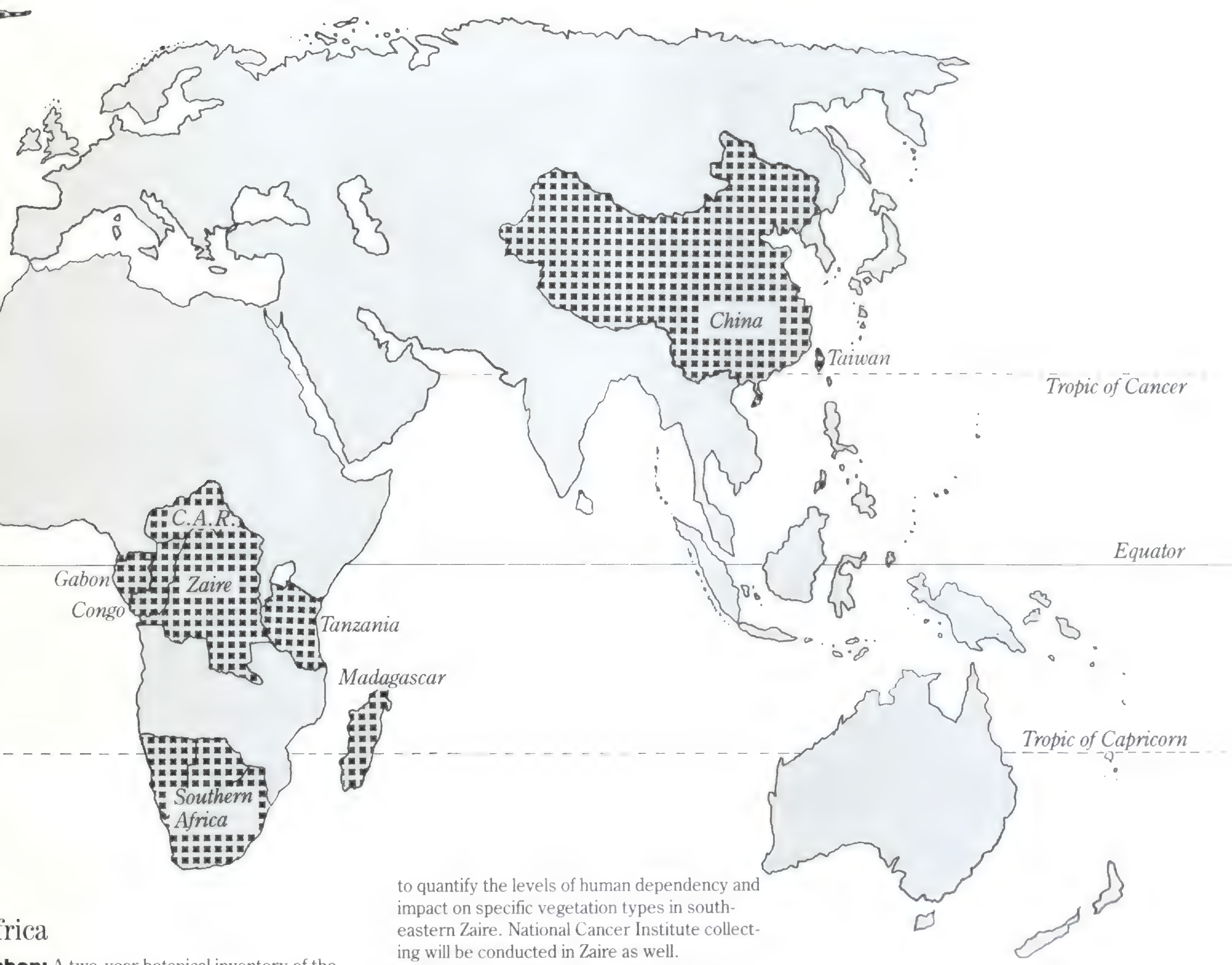
Peru: The *Flora of Peru* project, originally focused primarily on completing the publication of the *Flora of Peru*, has expanded to include ecological inventory and a study of economically useful plants, as well as general collecting and the preparation of a computerized checklist of the flora.

Bolivia: The Garden is sponsoring general floristic inventory work in Bolivia, which is botanically one of the most poorly known countries in South America. In addition, Garden researchers are working on an inventory of trees from the Serranía de Pilon Lajas and providing training in the study of trees for Bolivians.

Chile: The Garden is working with the Universidad de Concepción, Chile, in preparing a new *Flora of Chile*. Chile has a high degree of plant endemism in its biogeographically diverse regions. The new *Flora* revises a work completed in 1854 and will be written with the help of more than 40 collaborators from around the world. Completion is expected in about 12 years.

Argentina: A five-year agreement of scientific cooperation was signed between the Garden and the Consejo Nacional de Investigación Científica y Tecnológica (CONICET) in 1991. The agreement establishes permanent cooperation and exchan of information between the two institutions for the study of the flora of Argentina.

Paraguay: Garden researchers are working on the *Flora of Paraguay*, an international cooperative program coordinated by the Cons vatoire et Jardin Botaniques de Geneve and jointly edited and published by the Garden and Geneva. As part of the *Flora*, the Garden beg an intense program of floristic inventory. Collaborative agreements aimed at strengthening and consolidating the local herbaria and buildin scientific capabilities for botanical research hav been signed with the Ministerio de Agricultur Ganadería, the Universidad Nacional, and the Jardín Botánico y Zoológico.



frica

bon: A two-year botanical inventory of the be-Okanda Reserve began this year, in conction with the staff of the Herbier National du bon. The information will assist researchers rking on the *Flora of Gabon*, which has one of richest floras in central Africa. In addition, earchers have been collecting in Gabon for National Cancer Institute (NCI) since 1989.

entral African Republic: The tropical ests of the Central African Republic are ong the areas in which the Garden is most ive and interested. Botanical exploration this botanically poorly known part of Africa ongoing.

ongo: In 1991 the Garden signed a new colorative agreement with The Congo Republic, abling it to develop a program in this floristiy rich and underexplored area.

ire: The Garden is beginning a new threear project sponsored by USAID to collect ormation on indigenously used plants within endemic-rich Zambezian woodland area of Shaba province. Garden researchers, in colloration with scientists at the Centre Regional Etudes Nucleaires de Kinshasa, will attempt to quantify the levels of human dependency and impact on specific vegetation types in southeastern Zaire. National Cancer Institute collecting will be conducted in Zaire as well.

Tanzania: A collecting program has been established in Tanzania, with the Department of Botany at the University of Dar es Salaam. Collecting continues for the NCI program in conjunction with botanists from the University and the Traditional Medicine Research Unit.

Southern Africa: The mosses and irises of temperate and subtropical southern Africa are the subjects of ongoing investigations.

Madagascar: Researchers are conducting general botanical inventories throughout Madagascar, with intensive work in four priority protected areas. A new project, funded by the National Science Foundation, will produce a computerized conspectus of the approximately 10,000 species of Malagasy plants, in collaboration with the Muséum National d'Histoire Naturelle of Paris, the Parc Botanique et Zoologique de Tsimbazaza and the Centre National de la Recherche Apliquée au Développement Rural. The Garden's activities in Madagascar are designed to increase botanical collections from the country's many underexplored areas, especially the rain forest, and to assist and train Malagasy scientists.

Asia

China: The Garden is the coordination center for the *Flora of China* project, a joint Sino-American project to publish for the first time in English a revised *Flora* based on *Flora Reipublicae Popularis Sinicae*. A total of 25 volumes is planned; the first is scheduled for publication in 1992. The whole project is expected to be completed in about 15 years.

Republic of China (Taiwan): The Garden will be U.S. headquarters for the Botanical Inventory of Taiwan, a new binational collaborative project between botanists from the United States and the Republic of China. The project aims to build upon and go beyond traditional floristic studies.

Moscow
KAZAKHSTAN
CHINA
INDIA

Collecting Mosses Along the "Great Silk Route"

by Robert E. Magill, Ph.D.
Curator of Bryophytes

In July of 1991 a team of Garden research scientists visited the Republic of Kazakhstan at the invitation of Isa Baitulin, vice president of the Kazakhstan Academy of Sciences. In September and October the Garden in turn hosted a visit by Dr. Baitulin; Dr. Sergei Bedaren, director of the Kazakhstan Institute of Botany; and Ms. Saule Abdulina, scientist in charge of computers at the Institute.

Dr. Baitulin and Dr. Bedaren worked in the herbarium and went on field trips in Missouri, Illinois and Iowa, collecting seeds of plants that can be successfully grown in Kazakhstan. They were interested in plants for agriculture and ornamental horticulture, both for direct introduction and for breeding with native Kazak plant species.

Ms. Abdulina studied the Garden's computer system and exchanged information with TROPICOS, the Garden's computer database. She returned home with a copy of pcTROPICOS, which will allow the Institute in Kazakhstan to continue to exchange botanical information with the Garden.

On their trip in July, the Garden scientists collected bryophytes, or mosses, in the remote mountains and other regions near Alma-Ata, the capital of Kazakhstan. The rich flora in the mountains behind Alma-Ata provided an important collection of bryophytes from this remote area, the only specimens available in the West for almost 95 years. The following is an account of their visit.—Editor

BETWEEN the Middle East and China lie the boundless Sary Arki Steppes and Kara Kum Desert of the Republic of Kazakhstan. This central Asia republic is the second largest in land area of the old Soviet Union, containing over 2.7 million square kilometers and maintaining a population of over 15 million people. The Republic contains much of the country's oil and has impressive agricultural potential. The isolation imposed upon the area by the Central Government has made the people of this ethnically diverse culture unduly suspicious of western visitors. However, when the native Kazakhs and the more recent Russian emigrants speak of their new dream of opening markets to the West and their pride in what they have been able to accomplish, they quickly reveal their true hospitality. In fact, celebrations of our visit featuring massive feasts and canisters of Kazakh brandy or Russian vodka were a weekly occurrence.

The rich heritage of the region had its beginnings with the numerous nomadic tribes that once roamed the steppes of central Asia. As the population grew, clusters of huts coalesced into towns and villages. Serving as centers of arts, crafts, and sciences, the towns that arose along the natural route from the East became "Ancient City States" that thrived throughout medieval times. As early as the 7th century the main road from China to the Middle East ran through southern Kazakhstan. The region's major cities of the modern era represent these ancient centers of trade and respite along what is known as the "Great Silk Route." The caravans laden with silk and oriental spices bound for Byzantium and Rome enriched the culture as they traveled along this once famous trade route. Permanent agriculture developed in the region during the 10th and 12th centuries to support the route, ushering in a Golden Age of power and prestige.

The 13th century brought Ghenghis-khan's armies, and, with his catastrophic campaigns, the decline of urban settlements. By the 16th century the "Great Silk Route" had lost its former significance, and most of the ancient cities had ceased to exist.

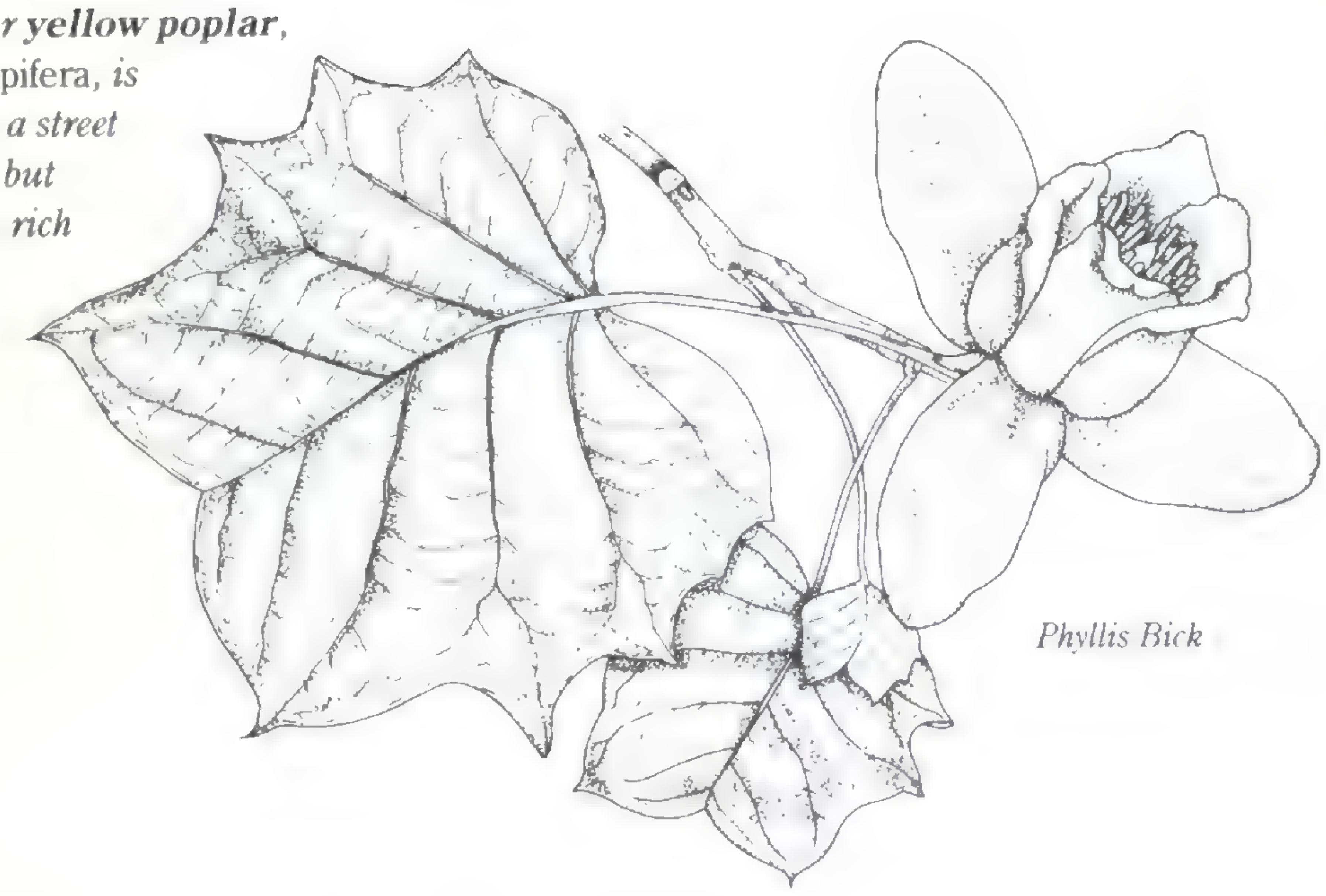
Our expedition to Alma-Ata included three scientists from the Garden: myself and Dr. Bruce Allen, both bryologists in the Division of Research, and Dr. Alan Whittemore, a post-doctoral researcher for the *Flora of North America* project. We traveled nearly two days before a six-hour flight from Moscow deposited us almost exactly halfway around the world in Central Asia. The base of operations for our collecting expedition was Alma-Ata. Once a medieval settlement along the "Great Silk Route," the city unfortunately was the first to be razed during Ghenghis-khan's campaigns. Because of the beauty of the setting and amiable weather, the city was reestablished in the 18th century and later became the capital of Soviet Kazakhstan. Today the modern Soviet industrial, scientific and educational infrastructure developed at Alma-Ata stands in stark contrast to the empty stores and long lines of frustrated people.

The diverse topography of the area around Alma-Ata allowed us to collect in arid, sand deserts one day and explore for mosses around a glacier as snow fell the next. The collections gathered on this trip will provide important floristic and phytogeographical information for the bryophyte flora projects currently underway in North America and China. The new era of cooperation between the Garden and the Kazakh Academy of Sciences will permit further exploration along the "Great Silk Route."

RICHARD BENKOF

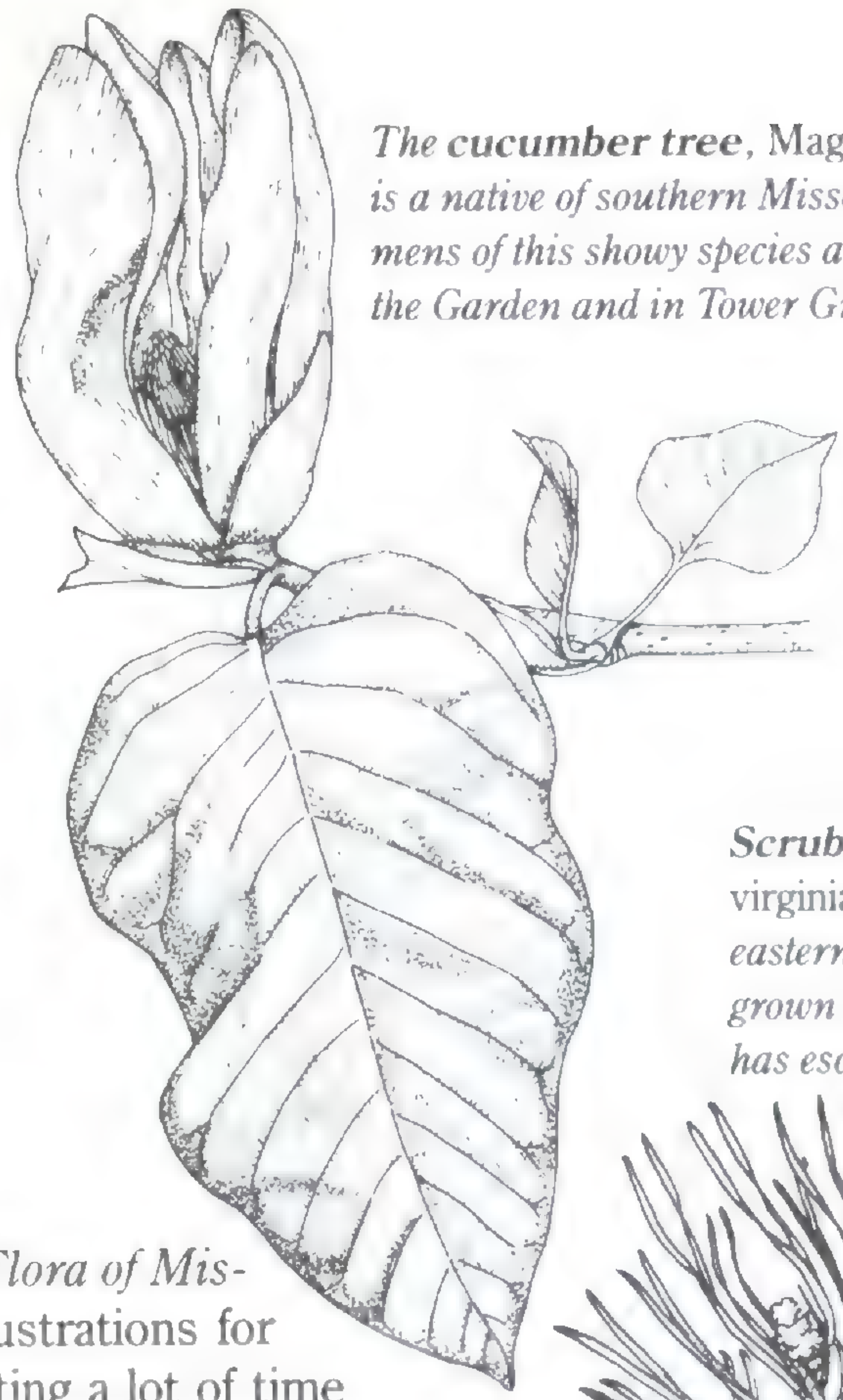
Visitors from Kazakhstan at the Garden (left to right): Bob Magill, MBG; Isa Baitulin, Saule Abdulina, and Sergei Bedaren.

e ***tulip tree*** *or* ***yellow poplar,*** riodendron tulipifera, *is dely planted as a street e in Missouri, but ows natively on rich oded slopes inly in the utheastern rner of the te.*



Phyllis Bick

The **cucumber tree**, Magnolia acuminata, *is a native of southern Missouri. Large specimens of this showy species are cultivated at the Garden and in Tower Grove Park.*



Phyllis Bick

Scrub pine, Pinus virginiana, *is native to the eastern U.S., but is widely grown in Missouri, and has escaped from cultivation in a few areas.*

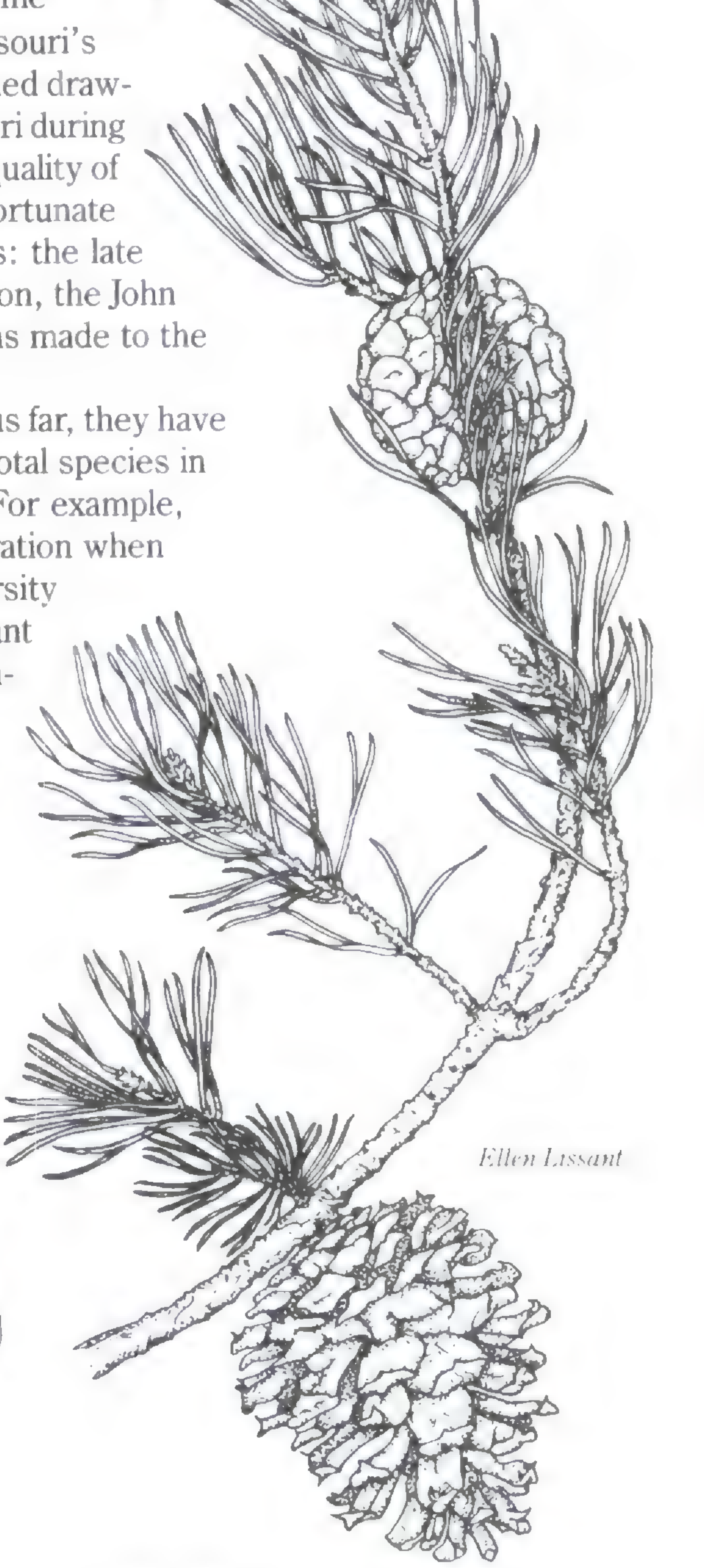
Botanical Beauty

by George Yatskievych, Ph.D.

How do you dress-up a flora? When asked what they liked best about *Steyermark's Flora of Mis-ri*, most professional and amateur botanists remarked that they enjoyed having illustrations for ch species. With this in mind, the *Flora of Missouri* project workers have been putting a lot of time ely into the preparation of an entirely new set of pen-and-ink drawings for the revised edition of Missouri's ristic manual, slated for completion in late 1995. The first edition, published in 1963, already contained draw-s for many of the species. However, the large number of plants newly discovered to grow in Missouri during past 30 years, the generally poor condition of the existing originals, and the desire to improve the quality of ny of the renderings made it imperative to "start from scratch." The Garden has been extremely fortunate have received financial support for this important work from the following individuals and groups: the late s. John S. Lehmann, the Academy of Science of St. Louis, the Missouri Department of Conservation, the John en Love Foundation, and the Wednesday Club of St. Louis, as well as a portion of the contributions made to the rden in honor of the late Mr. A. Timon Primm.

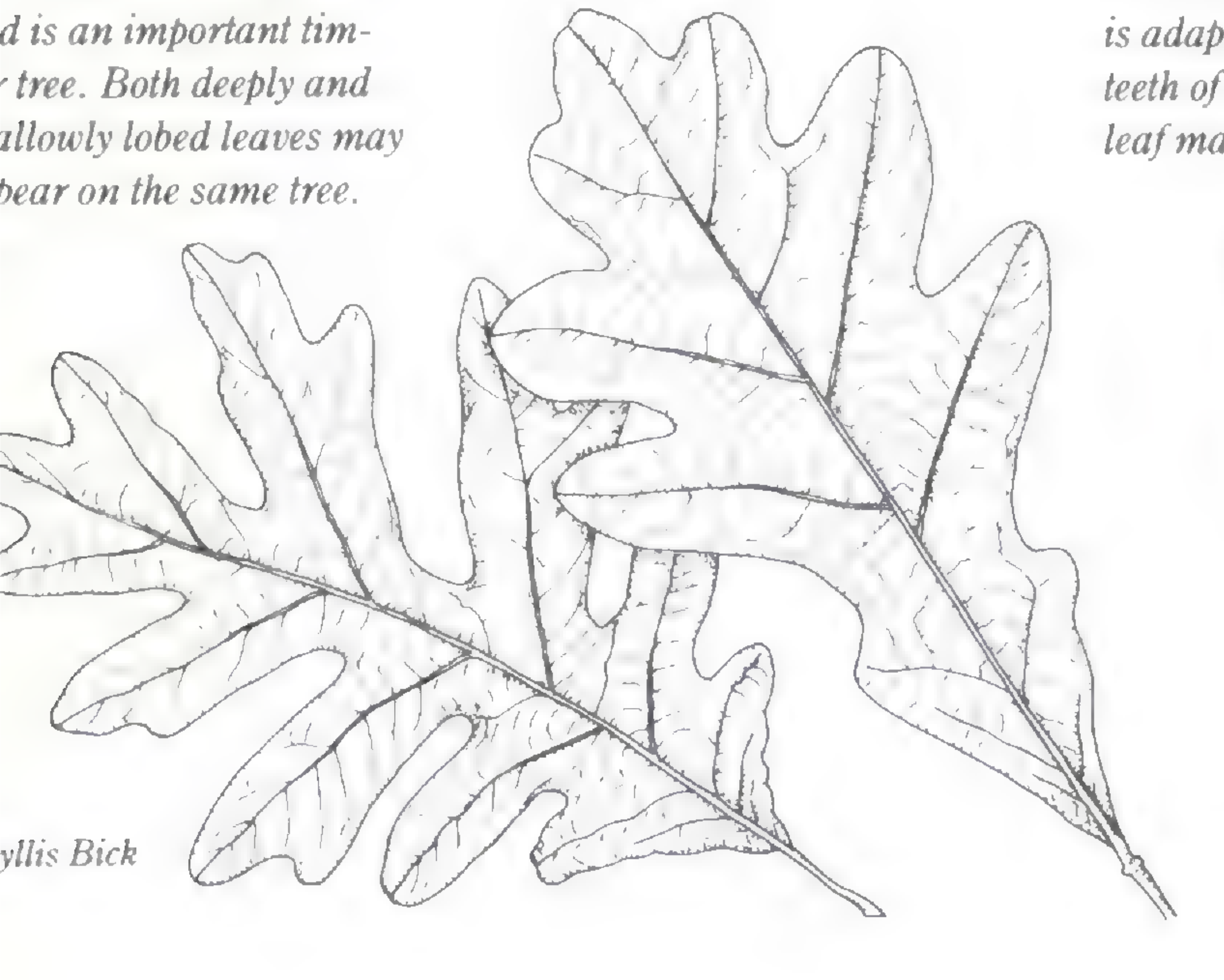
A dozen talented artists are presently working freelance on various families of Missouri plants. Thus far, they have mpleted about 200 of an estimated 500 full-page plates, illustrating over 1000 of the nearly 2600 total species in flora. All of these artists have other jobs, but they have spent long hours on this labor of love. For example, yllis Bick, of St. Louis, is a graphic designer by training, but became interested in botanical illustration when e visited a botanical garden in England. Linda Ellis, who lives in Kansas City, worked for the University tension Service for several years and is now involved in graphic design and illustration. Ellen Lissant s a botany professor in the St. Louis area for many years before retiring to Clever, Missouri, south-st of Springfield, where she teaches and draws.

The wonderful new art work will greatly improve the beauty of the "well-dressed" new edition, d hopefully make it easier to use as well. The illustrations on this page will all be included in the thcoming *Flora*.



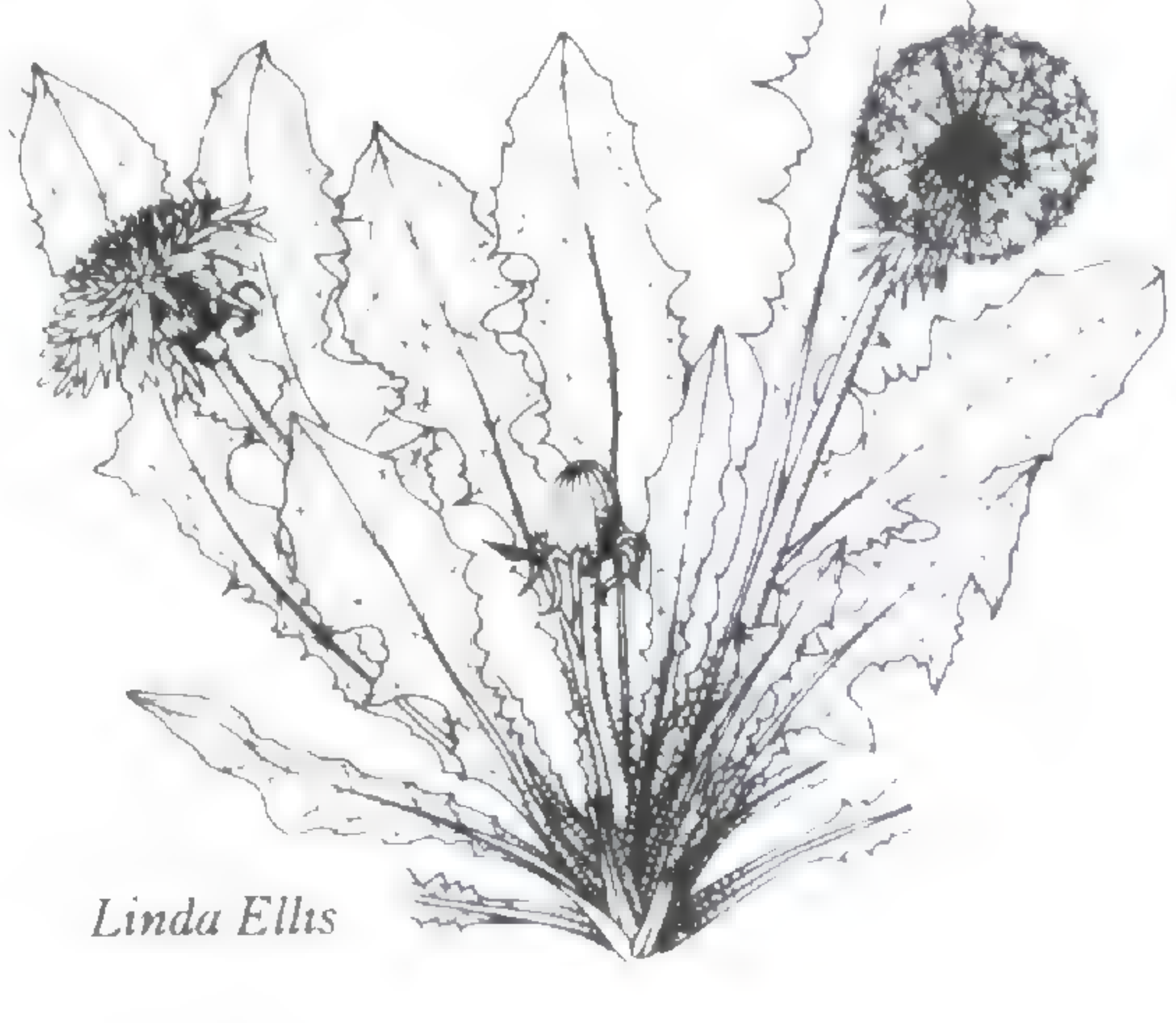
Ellen Lissant

hite oak, Quercus *a, is one of Missouri's st common oak species, d is an important tim- tree. Both deeply and allowly lobed leaves may bear on the same tree.*



yllis Bick

The **common dandelion**, Taraxacum officinale, *is a familiar weed in lawns and disturbed soil. The name dandelion is adapted from the French* dents de lion, *teeth of the lion, referring to the jagged leaf margins.*



Linda Ellis

George Yatskievych is Curator of Missouri Plants at the Garden and a botanist with the Missouri Department of Conservation. He directs the Flora of Missouri Project.

THE HENRY SHAW ACADEMY

An Adventure In Learning

"Wow, this is really neat!"

Students in the Garden's Henry Shaw Academy (HSA) have that reaction to their classes all the time, even when they are standing up to their ankles in mud on a chilly gravel bar.

HSA students are learning science firsthand through an innovative program begun at the Garden in 1986. The program offers motivated youngsters the opportunity to build and expand on their classroom studies. Under the leadership of Jeff DePew, coordinator of the program, students experience the wonder and beauty of the natural world, and discover the mysteries of science by touching, looking, listening and seeing.

RICHARD BENKOF

Jeff DePew with HSA students

Stream Ecology canoe trip

"We try to give each age group an experience that will excite them about learning science," said Jeff, whose enthusiasm is contagious. "As children move up through the program they find that each level builds on the one before, creating a clear set of steps to developing scientific understanding. Each student keeps a journal of his work in each class, which will include a bibliography and projects for further study. This gives them something to take away that keeps the learning process alive."

Jeff's commitment and dedication have paid off. The HSA has grown from a small group of classes for ages 7 to 13 plus a float trip for older children to a wide variety of courses offered throughout the year. Preschoolers ages 4 to 6, together with their parents, can experience the Pitzman Nature Study Program; ages 7 to 12 have Summer Science Camp, after school programs, and weekend classes. Ages 13 to 14 can take a year-long program in Stream Ecology, and ages 14 to 18 can take the year-long Explorers Field Study Program plus a summer apprenticeship program with the Garden's Horticulture staff.

"Students in Stream Ecology or the Field Study Program work directly with active research programs," Jeff explained. "Many of these students are interested in a career in science, and we give them a chance to see professional scientists in action. We take advantage of the research facilities here at the Garden, and also at the Zoo, Science Center, Washington University, Missouri wetlands, the Raptor Rehabilitation Center, the Wild Canid Survival and Research Center in Eureka, the Ozark Underground Laboratory, Great Smoky Mountain National Park, Alligator River Wildlife Refuge in North Carolina, and Hofstra University Marine Lab Site in Jamaica. Stream Ecology students supply research data to the Missouri Department of Conservation Stream Team Project, a nationally recognized environmental stream preservation program, and to TERC (Technology Education Resource Centers), an international global ecology database."

The Stream Ecology Program is DePew's newest innovation. Students explore the upper Meramec River on weekend canoeing field trips, collecting water samples and data on wildlife, erosion, and biological health of the ecosystem. The two-day float trips provide a "total experience" for 48 hours of close contact with nature, building leadership and teamwork skills. Students follow up with experiments and further study, and see their data utilized for ongoing research. All HSA staff are certified in first aid, water safety, and canoeing skills.

"We try to provide a challenging experience that is also fun," said Jeff. "We want to help children get excited about science and stay excited about learning all their lives."

HSA Winter Classes for 1992

Interested parents, teachers or students may call the Garden's Education Division at 577-5135 or 577-5140 for a course brochure or registration information.

Upcoming HSA Spring Programs

Bonsai classes with the Bonsai Society
Spring Canoeing and Caving
Planting a Butterfly Garden
Stream Ecology
Wildlife Ecology
Trees for Life

Watch for HSA Summer Science Camp Brochure in March!

Classes will include:
For 4-6 year olds:
The Pitzman Natural History Program

For 7-9 year olds:
Creations From the Earth, Puzzles of Life, and Garden Discoveries

For 10-12 year olds:
River Ecology, Our Water Planet, and Camping at the Arboretum

For 14-17 year olds:
Garden Apprenticeships

WILLIAM DAVIT

A view of Deer Creek

NEW NATURE STUDY CENTER

Window on the Natural World

A QUIET valley, surrounded by deep woods, is filled with the rustle of wind in the grasses and clear notes of birdsong. A meandering stream sparkles over the gravel bar. This natural retreat is found not in a distant wilderness but in the heart of the St. Louis metropolitan area.

This past September approval was granted for a new nature study center to be operated by the Garden in St. Louis County. The Litzsinger Road Ecology Foundation, formed by a private anonymous donor, will provide and maintain a 34-acre tract for ecological and environmental education programs to be managed and conducted by the Garden. The special use permit, granted by the Ladue City Council after approval by the Zoning and Planning Commission, allows small groups to visit the facility under supervision by Garden staff. The nature center is not open to the public.

''The property is ideally suited for this purpose,'' said Dr. Larry DeBuhr, director of education at the Garden. ''It is largely undeveloped, with a creek, bottomland, grassland, and woods. It presents a wonderful opportunity to teach students in an 'open air classroom.' The Center's close proximity to the Garden and to area schools means that we can schedule these kinds of programs more easily, and take advantage of the opportunity to enrich science education in St. Louis.''

William Davit, a former staff naturalist at Shaw Arboretum, has been named manager for the center. Although the property will remain undeveloped, Bill has been hard at work with projects planned to enhance and protect its ecological diversity.

Ten acres of tallgrass prairie have been established. Bill planted it with wildflower seeds from the Arboretum and a variety of grasses, including big and little bluestem, Indian grass, eastern gama grass, rosinweed, yellow coneflowers, purple bergamot, and Maximilian sunflowers. He plans to introduce as many native species as growing conditions will permit.

The woods are a treasure trove of trees, including hackberry, walnut, pawpaw, sycamore, cottonwood, river birch and box elder. Wildflowers will thrive in the rich bottomland soil, especially trillium, Virginia bluebells, sweet cicely, green dragon and sweet William. But first, Bill says, ''we're working to control the invasive species that have taken over some areas: Euonymous, bush honeysuckle, and Japanese hops.''

Bill is also working in consultation with the Missouri Department of Conservation and the Soil Conservation Service to find the best means to manage the stream bank erosion threatening portions of Deer Creek, which runs through the property.

The acreage is home to a surprising variety of wildlife, considering its location. Bill reports seeing deer, raccoons, and wild turkey, as well as the more common squirrels and opossums. He has had reports of fox, and the prairie attracts a wide variety of birds.

''We are absolutely delighted to have the opportunity to work with the Litzsinger Road Ecology Foundation on this project,'' said Dr. Peter Raven. ''This is a splendid gift to the people of St. Louis and we look forward to the challenges it provides.''

School Partnership Program Combines Art and Science

''Botanical Illustration and Writing,'' a special course offered by the Garden, brings together art and science students from city and county schools. Instructor Nicola Hellmuth-MacPherson visits students at middle and high schools for an introductory lecture; then the classes visit the Garden for a workshop on drawing plants and writing about them. The students also have an opportunity to visit the Garden's herbarium, where they observe the work of Garden illustrator John Myers.

The course emphasizes looking at plants through the eyes of a scientist and an artist, and discussing the differences in the two approaches. Botanical illustration is a very old art that evolved in answer to the need for scientifically accurate descriptions of herbal medicine. The decorative approach to drawing plants is more interpretive and often idealized, sacrificing some details to enhance the design of the page and convey the beauty of the plant. These two approaches are used in writing about plants as well.

''Students are encouraged to see the beauty, discipline, and merits of each approach, and to consider ways that they can complement one another,'' said MacPherson. ''We find that it is an exciting way to introduce them to some new ways of looking at the world.''

RICHARD BENKOF

Nicola Hellmuth-MacPherson (top) and John Myers (bottom) worked with middle school students from city and county schools in a workshop in November.

Home Gardening

Perennials

Finding time to garden is an important consideration today, yet everyone wants the garden and landscape to look as if there were a full time gardener on duty! In light of this, perennials are a good place to start planning next year's garden, as these plants generally require lower maintenance and care.

To create a colorful display of perennials from April until September is a very challenging undertaking in the St. Louis area. Every gardener wants to choose plants that have exceptionally long flowering periods, remain disease and pest free, and are hardy in our local climate. Some top performers are described below. They all require a location in full sun.

EARLY

In a warm site, basket-of-gold, *Aurinia saxatilis*, displays its bright yellow flowers early in April and is a welcome sight, especially when combined with red and yellow tulips. Also beginning in April and extending into June is rock cress, *Arabis caucasica*. Its gray green foliage should be cut back after the floral display is over.

Other early bloomers are moss pink, *Phlox subulata*, and edging candytuft, *Iberis sempervirens*. The moss pink produces a dense evergreen ground cover and bears its magenta, pink, or white flowers from mid-April to mid-May. Candytuft displays its rounded heads of pure white flowers in early spring, and these should be sheared back when faded. Common aubrieta, *Aubrieta deltoidea*, carries hundreds of mauve to deep purple flowers which cover this mound-like perennial from late April to June. The flowers should be cut back to improve the compactness of the gray green foliage.

Cushion euphorbia, *Euphorbia epithymoides*, and myrtle euphorbia, *Euphorbia myrsinites*, are two easy-to-grow plants primed for an early spring show. Their charming two-month display comes from their showy yellow bracts.

MAY

From May onwards, bugloss, *Anchusa azurea*, displays its striking gentian blue flowers on rather coarse foliage. It is a short-lived perennial, but propagates itself by self-sown seedlings. For a neat edging, common thrift, *Armeria maritima*, is hard to beat, with its grass like cushions of bright green foliage with lightly packed heads of pink flowers.

Blue wild indigo, *Baptisia australis*, is a fine substitute for lupines in our area, with attractive blue-green foliage and indigo blue flowers. Once the plant is mature do not try to relocate, as it has a deep taproot. Cottage pink, *Dianthus plumarius*, needs an alkaline soil for optimum performance; you will be rewarded with generous quantities of single to semi-double rose flowers with a clove-like fragrance.

Geranium endressii, known as wargrave pink or Pyrenean crane's-bill, makes an excellent ground cover with its incised foliage complemented by a generous display of rose-pink flowers. It starts flowering in May, then is spotty throughout the summer. Perennial flax, *Linum perenne*, has graceful and slender stems with arching tips that carry powder blue flowers in a continuing display for two months. In late summer, it is a good cultural practice to reduce the foliage by half to prevent plant exhaustion through over-blooming.

The longevity label applies totally to Chinese peony, *Paeonia lactiflora*. They may grow successfully in a thoroughly prepared location for a century. Chinese peonies thrive in the St. Louis area and come in a myriad of colors.

JUNE

To herald in June snow-in-summer, *Cerastium tomentosum*, is a good choice, though when its sprays of white flowers have faded, its grey-woolly leaves should be severely cut back to curtail its invasive nature. There are numerous campanulas, but two that perform consistently are clustered bellflower, *Campanula glomerata*, and peachleaf bellflower, *Campanula persicifolia*. Clustered bellflower has deep violet flowers; 'Joan Elliott' is an outstanding cultivar. Peachleaf bellflower has violet flowers, a particularly good cultivar is the white 'Snowdrift.'

The terminal white flower spikes of the gas plant, *Dictamnus albus*, have a lemon fragrance, as do the leaves. Once established, the gas plant does not tolerate disturbance because of its deep root system. Lance-leaved coreopsis, *Coreopsis lanceolata*, is native to North America, long-lived, and flowers from early June to September. Daylilies, *Hemerocallis*, are no longer the Cinderella of the plant world. These hardy favorites have been hybridized in recent years resulting in numerous outstanding cultivars that are splendid for successional blooming. Siberian iris, *Iris sibirica*, is a beardless type iris flowering from June to early July. It favors a rich, moist soil. 'Caesar's Brother,' with deep purple flowers, deserves a plant Oscar.

Catmint, *Nepeta mussinii*, makes a vigorous ground cover with its small silvery-gray leaves and lavender colored flowers. If the foliage is cut back by half after flowering, you will be rewarded with another floral flush.

Missouri primrose, *Oenothera macrocarpa*, bears its five-inch primrose yellow flowers from mid-June to August. It demands a well drained and alkaline soil. Another excellent and long blooming plant is *Oenothera tetragona*, with one and a half-inch flowers that are lemon yellow an cup shaped.

Balloon flowers, *Platycodon grandiflorus*, are slow to break dormancy in the spring but they flower from mid-June to August. The blue "puffed" flower buds open up to two and a half-inch saucer-shaped stars, much admired by the Japanese. Balloo flowers do not tolerate disturbance once they are established.

JULY

We begin July with what is considered one of the ten best perennials, threadleaf coreopsis, *Coreopsis verticillata*. Its golden yellow flowers last for two months and it is very accommodating with an attractive mass of filmy foliage. Purple coneflower, *Echinacea purpurea*, is native to the United States and is very drought tolerant. The daisy-like petals are reflexed and have a cone shaped mahogany center. 'White Lustre' is a desirable hybrid.

Plume poppy, *Macleaya microcarpa*, has large and beautiful leaves, grey green above an grey white below, giving it an almost tropical appearance. The leaves are terminated with a branching plume of flesh-colore fluffy flowers. It can be invasive so be careful to grow it in an open area.

Small globe thistle, *Echinops ritro*, has striking and deeply lobed foliage. This plant is complemented by unusual spherical shaped metallic blue flowers tha provide color even before they open up, with contrasts beautifully with white or pink *Phlox paniculata*. Obedient plant, *Physostegia virginiana*, is so named because the purplish ros flowers have hinged stalks that "stay put" when bent. Obedien plant flowers from early July to September.

July would not be complete without including coneflower, *Rudbeckia fulgida*, which bears its vivid yellow flowers in profusion as late as early October. The cultivar 'Goldsturm' is a nust for everyone's garden, rge or small.

UGUST

To herald the arrival of ugust we will include a plant ative to Kansas, Kansas blazing-tar, *Liatris pycnostachya*. The osy lavender flowers of this nique plant open up first at the op of the spike. Include the elated *Liatris spicata* on your 'wish'' list.

The peacock blue flowers of hinese plumbago, *Ceratostigma illmottianum*, are complenented in early fall by foliage of a ronze cast. This is a top choice r the front of perennial bed or order as it may still be in flower early October.

Live forever, *Sedum spectaile*, with its fleshy glaucous grey eaves, is beautiful throughout the ummer. Each stem terminates in flat topped mass of tiny rose ink florets that are much loved y butterflies and bees. A particurly outstanding clone is 'Brilant' with raspberry red flowers.

Common sneezeweed, *Helenium autumnale*, is one of the parents of a wide range of hybrids that display yellow, orange and brown shades from August to October. 'Coppelia' (deep copper orange) and 'Moerheim Beauty' (reddish brown) are but two of the hybrids and all associate well with creamy white flowers.

Joe-Pye weed, *Eupatorium purpureum*, grows up to six feet tall and is an imposing native American demanding a fairly large garden to display its fuzzy purplish rose flowers. The blooms will outshine most others from mid-August through early October.

SEPTEMBER

Arriving in September we turn to the many colors of chrysanthemums, which may be planted in an empty space available in the perennial beds or borders. A mum species is Nippon daisy, *Chrysanthemum nipponicum*, one of the last flowers to open. The blossoms are a pure white and must be seen to be appreciated. The asters are becoming more popular recently and certainly provide one an opportunity to display their showy blooms late in the season. The Oregon hybrids are short, 10-15 inches in height, so require no staking.

None of the grey-leaved plants such as wormwood, *Artemisia* 'Powis Castle,' have been included here. However, they should at least be mentioned because they act as a color catalyst for all of the other perennials. Also, no perennial bed will be absolutely complete without some annuals to add timely color when few perennials are in bloom. One good choice is *Cleome*, which performs so well during the heat of mid-summer when many of the perennials may look "tired."

This article was written by Brian Ward, Garden horticulturist, and Steven Cline, Ph.D., manager of the Center for Home Gardening.

NEW!
Master Composter HOTLINE
314/577-9555

9 a.m. to noon, Monday through Friday; after hours leave a message and your call will be returned.

The Garden has established the Master Composter Program to help the community respond to the prohibition of yard waste in landfills as of January 1, 1992. This community education program includes speakers, demonstrations, a video, and instruction by specially trained Master Gardeners.

Watch for more information in the March issue of the *Bulletin*. The Master Composter Program is supported by the Monsanto Fund.

Timely Tips from the Answer Service

Do you have a plant question? Call the Horticultural Answer Service, Monday through Friday, 9 a.m. to noon, at ***577-5143.***

January Tips

- ■ Gently brush off heavy snows from tree and shrub branches. To reduce injury, allow ice to melt naturally from plants. Attempting to remove ice may damage plants further.
- ■ Use sand, bird seed, sawdust or vermiculite to gain traction on icy paths. Avoid salt or ice melters as they may injure plants.
- ■ Some plants are sensitive to the fluorine and chlorine in tap water. Water containers should stand overnight to allow these gases to dissipate before using on plants.
- ■ Allow tap water to warm to room temperature before using on houseplants.
- ■ Quarantine new gift plants to be sure they do not harbor any insect pests.
- ■ Try sprouting a test sample of leftover seeds before ordering new seeds for spring. Roll up 10 seeds in a damp paper towel. Keep moist and warm. Check for germination in a week. If fewer than half sprout, order fresh seed.
- ■ If you didn't get your bulbs planted before the ground froze, plant them immediately in individual peat pots and place the pots in flats. Set them outside where it is cold and bury the bulbs under thick blankets of leaves. Transplant them into the garden any time weather permits.
- ■ Cakes of suet hung in trees will attract insect-hunting woodpeckers to your garden.

February Tips

- ■ Store wood ashes in sealed, fireproof containers. Apply a dusting around lilacs, baby's breath, asters, lilies and roses in spring. Do not apply to acid-loving plants. Excess ashes may be composted.
- ■ Check all fruit trees for evidence of rodent injury to bark. Use baits or traps where necessary.
- ■ Begin pruning fruit trees. Apples and pears should be pruned first. Peaches and nectarines should be pruned just before they bloom. Dormant sprays can be applied to fruits now.
- ■ Don't work garden soil when it is too wet. Squeeze a handful of soil. It should form a ball that will crumble easily. If it is sticky, allow the soil to dry further before tilling or spading.
- ■ Dormant sprays can be applied to ornamentals now. These are best applied on a mild day when the temperatures stay above freezing.
- ■ Sow seeds of larkspur, sweet peas, shirley poppies and snapdragons outdoors now. These plants must sprout and begin growth well before warm weather arrives to bloom best.
- ■ Check bulbs in storage and discard any that show signs of rot.
- ■ Begin to fertilize house plants as they show signs of new growth. Plants that are still resting should not be fertilized yet.
- ■ Now is a good time to repot any root-bound house plants. Choose a new pot that is only one or two inches larger in diameter than the current container.

—Chip Tynan, The Answer Service

MEMBERS' EVENTS

January 9
Members' Gardening Lecture: "Backyard Composting"

1 p.m., Shoenberg Auditorium. A demonstration lecture by Dr. Steve Cline, Manager of the Kemper Center for Home Gardening. Learn how to deal with yard waste so you can comply with the new state law eliminating yard waste disposal in landfills. Free, for members only. Limited seating.

January 21
Members' Day "Orchids: Jewels of the Rain Forest"

11 a.m., Shoenberg Auditorium. Slides and talk depicting the travels and studies of lady slipper orchids in Central and South America by Dr. Lucile McCook, Garden Horticultural Taxonomist.

1:30 p.m., Shoenberg Auditorium American Orchid Society video: "Potting and Mounting Orchids: Warm to Intermediate Temperatures". Marilyn LeDoux, Horticulturist for the Garden's orchid collection, will be available to answer your questions. Free, for members only. Limited seating for lectures.

February 11
Members' Day "Secrets of the Rain Forest"

7:30 p.m., Shoenberg Auditorium. Join Dr. Walter H. Lewis, Professor of Biology at Washington University, for a *National Geographic Explorer* video on the Jivaro Indians and medicinal plants of the Amazonian rain forest. Dr. Lewis will set the stage for a lively and fascinating discussion. Free, for members only. Limited seating.

Missouri Botanical Garden

CALENDAR OF EVENTS

January-February 1992

January 18 - February 16
Orchid Show

9 a.m. to 5 p.m. daily, Orthwein Floral Hall. In the midst of winter, step into a tropical paradise! An exotic rain forest setting is filled with the vibrant colors of thousands of blooming orchids in an astonishing array of species, surrounded by ferns, bromeliads and other tropical plants. Free with regular Garden admission. *Members' Preview—see January 17.*

"Orchids of Gold" Display

9 a.m. to 5 p.m. daily during the Orchid Show, in the foyer of Orthwein Floral Hall. Mickey A. Nax presents a collection of nearly 100 orchid sculptures of 14-18 carat gold, cast from living flowers and perfect in every detail. The collection includes extremely rare and unusual orchids, some cast from the only known plant in cultivation. Blooms range in size from ¼ inch to 3½ inches. Free with regular Garden admission.

Final Fridays
"Spotlight on Rain Forest Research"

January 31, February 28, March 27
10 a.m. to 2 p.m., Climatron and Brookings Interpretive Center. Join members of the Garden's research staff for first hand demonstrations of the collection and preparation of plant specimens, the basis of botanical research. Look through a microscope, operate a plant press, examine dried plants, and learn how they are preserved for future study. Regular Garden admission.

JANUAR

11 SATURDAY

Exhibit: "The Plant Hunt
A Portrait of the Missour
Botanical Garden"

9 a.m. to 5 p.m., daily throu
February 23, Ridgway Cent
Spectacular color photograp
National Geographic staff ph
tographer James P. Blair tak
the August 1990 issue of *Na*
Geographic magazine. Free
regular Garden admission.

17 FRIDAY

Members' Preview: Orchi

5 to 8 p.m., Ridgway Cente
tainment, cash bar. Garden
Shop will be open. Dinner b
available in Gardenview Res
For members only.

28 TUESDAY

Curator's Talk: "Madaga
A Disappearing Paradise'

7:30 p.m., Shoenberg Audit
with Garden researcher Dr.
E. Schatz. See page 15. $2
door.

WALKING TOURS
Every Tuesday, Saturda
and Sunday 1:00 p.m.

Join the Garden Guides fo
tour of the grounds, featurin
the art, architecture, histor
and horticulture of the Gar
Meet at the ticket counter
Ridgway Center. Free wit
regular Garden admission

REASURES OF THE CLIMATRON

.iving Rain Forests of Latin America, Africa and Asia"

erience rain forest regions around the globe! Each month a special day-long event celebrates the culture of a different region with bits, tours, and music in the Climatron and films, lectures, and workshops in the Ridgway Center. See page 15. Free with regular en admission.

NUARY

SUNDAY **Living Rain Forests of Latin America**

to 5 p.m.
, Film: *The Emerald Forest.*
.ecture: ''Keepers of the
' with producer Norman
n, who will feature his award
documentary with a follow-up lecture and discussion. The documentary focuses on the destruction of the Lacandon jungle in southern Mexico and the contrasting sustainable agriculture practiced by the Lancandon people.

FEBRUARY

29 SATURDAY

Living Rain Forests of Africa

10 a.m. to 5 p.m.
11 a.m. Film: *Baka: The People of the Rain Forest.*

COMING IN MARCH

Living Rain Forests of Asia

Watch for more information in the March *Bulletin.*

FEBRUARY

SATURDAY-SUNDAY

Society Annual Show

5 p.m. Saturday, 9 a.m. to
Sunday, Ridgway Center.
ssouri Orchid Society holds
al display and sale of hun-
f orchids in bloom.

SUNDAY

e for Orchids

to 4 p.m., Ridgway Center.
s from the Garden and the
ri Orchid Society present
ctures, an orchid arranging
op, and activities for chil-
Vorkshops require reserva-
nd a materials fee: call
25.

TUESDAY

r's Talk: ''Adventures of a
cal Collector''

m., Shoenberg Auditorium,
arden researcher
omas B. Croat. See page 15.
e door.

SUNDAY

ron Tours

.m., Climatron. Special
r children, led by members
Henry Shaw Academy.

TUESDAY

r's Talk: ''Tropical
s: Cradles of Life''

m., Shoenberg Auditorium,
arden researcher Dr. Alwyn
try. See page 15. $2 at the

Black History Month

"From Dreams to Reality"

''From Dreams to Reality'' Wednesday Film Series is cosponsored by the North St. Louis Arts Council. For middle to senior high school students. For reservations, times and additional information call 577-5125.

5 WEDNESDAY

''From Dreams to Reality—A Tribute to Minority Inventors''

Narrated by Ossie Davis, this film shows the enormous contributions made by African-Americans in the fields of science, technology and medicine.

''Didn't We Ramble On: The Black Marching Band''

The spirit and soul of the West African people has been passed down, generation by generation, through the black marching band, from 17th century Europe to today's football fields of America. Dizzy Gillespie introduces the skillfully orchestrated maneuvers of the Florida A&M Marching Band, the direct fulfillment of an ageless ancestral idea.

12 WEDNESDAY

''Benjamin Banneker: The Man Who Loved the Stars''

A biography of American's first ''Black Man of Science.''

19 WEDNESDAY

''Zajota and the Boogie Spirit''

This colorful animated film traces the saga of black people from their origins in Africa to their present life in America. The folk tale of the goddess Zajota incorporates African rhythms and dance in portraying a people in harmony with the Boogie Spirit that is their soul.

''The Black Artists''

In this film, three contemporary black artists discuss their philosophy of art as they work. Featured are Dr. Samella Lewis, painter, William Pajaud, watercolorist, and John Riddle, sculptor, ceramist and teacher.

26 WEDNESDAY

''Two Dollars and a Dream''

A biography of Madame C. J. Walker, the child of slaves freed by the Civil War, who became America's first self-made millionairess. By interweaving social, economic and political history, the film also offers a view of black America from 1867 to 1930s.

9 SUNDAY

Celebrate the Gospel II

3:00 p.m., Shoenberg Auditorium. Join some of the area's finest choirs as they celebrate the rich cultural heritage of black gospel music from the past to the present. Free with regular Garden admission.

16 SUNDAY

Second Annual Community Beautification Awards

6:00 p.m., Shoenberg Auditorium. Five African-Americans will be honored for their contributions to neighborhood and/or community beautification efforts. Co-sponsored by Union Electric. Call 577-5125 for nomination forms; call for reservations beginning February 3.

22 SATURDAY

''Linkage to the Land''

10 a.m. to 3 p.m., Ridgway Center. As African-Americans contemplate the past, a strong linkage to the land is evident. To connect the past, present and future of African-American history with Mother Earth, this day of activities for children, adults and families will feature tours of African plants in the Climatron, terrarium and recycling workshops, African dance, community and residential gardening programs and a special puppet show that will highlight the relationship between Henry Shaw and John Feugh, an African-American who worked with Shaw during the 1800s.

From the Membership Office

1992 MEMBERS' TRAVEL PROGRAM

Gardens of Andalusia—MAY 7 TO 19, 1992

Garden Members are invited to join Mrs. Peter H. Raven and Patrick Bowe on a delightful tour of the gardens of Andalusia, Spain. Please call Brenda Banjak at (314) 577-9517 for tour details and reservation information.

Lewis and Clark Trail—JUNE 12 TO 25, 1992

Last year's tour retracing the rugged route of Lewis and Clark was such a success that we are repeating the tour again in 1992! Join hosts Dr. Ray Breun of the Jefferson National Expansion Historical Association and Alan Brant of the Missouri Botanical Garden as they guide their intrepid expeditionists into the "frontier," studying the flora and fauna along the route which in many places is just as it was when the original expedition took place 200 years ago. The motorcoach tour will leave St. Louis on Friday, June 12, and travel through cities along the trail including St. Joseph, Sioux City, Ft. Pierre, Billings, Great Falls, and Missoula, to Portland. Stops along the way will once again feature state and national parks and historical sites of the Lewis and Clark Expedition.

Santa Fe Trail—JULY 20 TO 29, 1992

Explore the old Santa Fe Trail which opened up the "Indian Territory" to traders and later to settlers, between the years 1821 and 1880. Led by Dr. Ray Breun of the Jefferson National Expansion Historical Association and Dr. Marshall Crosby of the Missouri Botanical Garden, this tour in natural history will expand your knowledge and understanding of the trials and tribulations faced by the early explorers and settlers as you retrace their steps and wagon trails and cross the ocean of prairie in the center of the country. The motorcoach tour will leave St. Louis on Monday, July 20. Stops along the trail include Ft. Osage, Independence, Baldwin City, Council Grove, Great Bend, Ft. Larned, Dodge City, Garden City, La Junta, Taos, and Santa Fe, returning through Amarillo, Oklahoma City and Tulsa. Historic sites along the trail will be visited and perhaps you will see the wagon ruts that still remain at places along the trail!

For a complete itinerary and information on these trips, call the Membership Office at (314) 577-9517.

1992 Members' Days

Jan. 21	*Orchids—"The Jewels of the Rain Forest"*
Feb. 11	*"Secrets of the Rain Forest"*
Mar. 11	*Film/Lecture—"Rain Forests: Our Threatened Heritage"*
Apr. 4	*Arboretum Jonquils & Dogwoods*
May 15	*Bats & Purple Martins*
June 26	*Members' Musical Evening*
July 14	*Moonlight Stroll*
Aug. 13	*Fun with Herbs*
Sept. 19	*Gardening Lecture/ Demonstration*
Oct. 18	*Garden Autumn Leaves & Cider*
Nov. 14	*Climatron Tropics—A Winter Tour*
Dec. 19	*Holiday Program*

Flowers and Candy for Your Valentine

This Valentine's Day send a year of flowers with a Missouri Botanical Garden Membership and a box of Fannie May Candy to your special Valentine. Call 577-5118 to order your Valentine membership. Gift recipients in the St. Louis metropolitan area will receive your unique Valentine gift delivered to their doorstep on February 14.

Membership Services Volunteers Are Honored

A luncheon honoring the Membership Services Desk volunteers was held on Friday, November 22, in Spink Pavilion. Special recognition awards were presented to Larry Thilking and Gene Spradling, for most hours volunteered; to Mim Kittner and Pat Becklean, for most memberships sold; and to Lib Walbaum, for most gifts distributed. Lillian Biggs was honored for most gifts distributed in one morning.

The desk volunteer program is chaired by D'Arcy Elsperman and Jean Crowder under the guidance of Members Board President, Sue Rapp. Last year 51 volunteers donated 2,286 hours at the Membership Services Desk and sold 29 percent of all new Garden memberships that year. Congratulations, one and all!

RICHARD BENKOF

(left to right) Membership Services Desk volunteers: Mim Kittner, Pat Becklean, Larry Thilking, Lib Walbaum, Sue Rapp, D'Arcy Elsperman, Lillian Biggs, and Jean Crowder.

Rain Forest Exhibit Comes to St. Louis

"Tropical Rainforests—A Disappearing Treasure," is a major traveling exhibition from the Smithsonian Institution coming to St. Louis this January. The Missouri Botanical Garden, St. Louis Science Center and St. Louis Zoo are cooperating in the presentation of this important national exhibit, which will be on display at the St. Louis Science Center from January 11 through April 5, 1992. The exhibit was developed by the Smithsonian Institution Traveling Exhibition Service (SITES), in cooperation with the World Wildlife Fund.

For more information about the exhibit or Science Center hours, call 314/289-4400. For information about group reservations, call 314/289-4424.

Special activities at the Garden that are related to the exhibit include:

Treasures of the Climatron

Living Rain Forests of Latin America, Africa and Asia

During the Smithsonian exhibit, visit the Garden's own living tropical rain forest in the Climatron for three special one-day events highlighting the culture of three different rain forest regions around the world. Demonstrations, tours, exhibits, music and more will give visitors a glimpse of the special plant diversity and customs of each region. Additional programs will be held in the Ridgway Center, including films, lectures, a display of "grocery store botany," puppet shows, terrarium workshops, and more. All events are free with regular Garden admission.

Sunday, January 26, 1992
10 a.m. to 5 p.m.
Living Rain Forests of Latin America

Saturday, February 29, 1992
10 a.m. to 5 p.m.
Living Rain Forests of Africa

Saturday, March 28, 1992
10 a.m. to 5 p.m.
Living Rain Forests of Asia

"Final Fridays"

January 31, February 28, March 27, 1992
10 a.m. to 2 p.m.
Climatron and Brookings Center

Join members of the Garden's research staff on the last Friday of the month for an exciting glimpse of the daily work of botanical research. Demonstrations in the Climatron and Brookings Interpretive Center will feature the collection and preparation of plants for future study, including the use of microscopes, plant presses, and dried herbarium specimens.

Curators' Talks

Don't miss these special lectures by Garden researchers who are among the world's foremost rain forest scientists.

"Madagascar: A Disappearing Paradise"
Dr. George E. Schatz, Assistant Curator of Madagascar Project
Tuesday, January 28, 1992
7:30 p.m., Shoenberg Auditorium.

Dr. Schatz went to Madagascar as the Garden's resident research botanist in 1987. In addition to his botanical exploration he has worked with Malagasy officials to protect the island's endangered forests and to train local scientists and conservationists.

Madagascar is home to many plants and animals found nowhere else on the planet. Come learn about the geography, unique treasures and culture of this disappearing paradise.

'Adventures of a Botanical Collector"
Dr. Thomas B. Croat,
P. A. Schulze Curator of Botany
Tuesday, February 4, 1992
7:30 p.m., Shoenberg Auditorium

Indiana Jones, move over! Dr. Croat has been collecting plants for 30 years, and most of that time has been in search of new species of the Philodendron family, Araceae, in Central and South America. During his work, he has weathered several lifetimes of exciting and harrowing experiences.

"Tropical Rain Forests: Cradles of Life"
Dr. Alwyn H. Gentry, Curator
Tuesday, February 18, 1992
7:30 p.m., Shoenberg Auditorium

Dr. Gentry has spent a lifetime studying tropical rain forests. Few people on Earth share his breadth of knowledge of these fascinating and valuable resources. In his talk, he will make the forest come alive as he explains why these unique and beautiful forests are truly the cradle of life on Earth.

MacArthur Foundation Supports Education Activities on the Rain Forest

The Garden and the St. Louis Science Center have received companion grants from The John D. and Catherine T. MacArthur Foundation to support educational and public outreach programs in conjunction with the Smithsonian exhibit "Tropical Rainforests: A Disappearing Treasure." The Garden has taken the lead in the development of educational materials for schools, targeting both students and teachers.

In 1989 the Garden, through an earlier grant from the MacArthur Foundation, developed a nationally distributed Suitcase Science Kit on tropical rain forests and a summer tropical rain forest teacher training course. The course was offered through U.M.-St. Louis in 1989 and 1991 and will be repeated in the summer of 1992. It will be followed by a trip to the Peruvian Amazon.

This past fall a series of workshops for teachers was held at the Zoo, Garden and Science Center to prepare teachers to visit the Exhibition and familiarize them with tropical rain forest resources at the three institutions. 500 copies of the exhibition's teacher manual were also duplicated and are being distributed through the Garden's Stupp Teacher Resource Center. Ten additional kits of the Tropical Rain Forest Suitcase Science Kit are being assembled to make rain forest curriculum, props and materials available to a greater number of area teachers. Teachers will also benefit from activity kits Education staff are assembling which will bring some of the Garden's existing rain forest classes to three different age groups of school children. A 20-minute slide program, presented by Garden volunteers, discussing tropical rain forests and the exhibition, is being made available to school and community groups.

Dr. Peter H. Raven, director of the Garden, will lead a panel of distinguished experts in a discussion in March on the complex issues, "What Will It Take To Save the Tropical Rain Forests?"

Additional activities and events will be offered through the Science Center and Zoo.

"An Enchanted Rain Forest"

FRIDAY, JANUARY 10, 1992

Mark your calendar for this spectacular event at the St. Louis Science Center sponsored by Missouri Botanical Garden, St. Louis Science Center and Saint Louis Zoo! Watch your mail for a detailed invitation.

Garden Orchid Display Takes Top Honors

A 50-square-foot exhibit of orchids designed by Garden staff garnered 34 awards, including the top honor, at the Mid-America Orchid Congress Show held in Louisville, Kentucky, October 28-30, 1991. The exhibit was given 92 points out of 100 by the American Orchid Society judges, winning the highest award, the American Orchid Society Gold Medal Certificate. It also won the A.O.S. Show Trophy, the Orchid Digest Show Trophy, and Show Trophy for all Open Competition classes.

The three-panel exhibit, designed specifically for this show, displayed some 40 orchid plants. It was designed by Brian LeDoux, the Garden's exhibit designer. The orchid plants were grown by Marilyn LeDoux, the Garden's orchid grower.

Individual plants in the exhibit received six Special Awards and Show Trophies, nine first-place ribbons, five second-place ribbons, and nine third-place ribbons.

Forty-eight plant exhibits were entered in the show by commercial growers, orchid societies, and individuals from the Midwest, South and Canada.

The Garden has one of the largest and finest orchid collections in the United States. The collection consists of over 10,000 plants, representing approximately 250 natural and hybrid genera and over 3,500 different species and hybrids. The oldest species in the collection, *Epidendrum ciliare*, dates from 1895.

Garden Floral Designer Honored

Pat Diehl Scace, floral designer for the Missouri Botanical Garden, has been accepted for membership in the prestigious American Institute of Floral Design (AIFD), after a rigorous, two-phase qualification process. The AIFD accreditation process can take up to three years.

The American Institute of Floral Design was founded in 1967 to provide recognition for its members as skilled, professional artists, to offer members symposia and other learning experiences, and to help lead and establish professional design trends for the floral industry. There are 14 AIFD members in Missouri. Scace will be the third member in the St. Louis metropolitan area.

"I've always associated AIFD with people of superior talent and I'm thrilled to be accepted as a member," says Scace.

Garden and Catholic Schools Team up for Science Education

This past July a team from St. Louis was one of 20 teams competitively chosen to attend the National Science Resource Center Summer Institute at the Smithsonian Institution in Washington, D.C. The team was composed of two staff members from the Garden, Pamela Pirio of eduction and Dan Harder of research, and two educators from the Archdiocese of St. Louis, Alan Winkelmann and Vera Cooper. They developed a Comprehensive Science Plan for improving science education in the entire Archdiocesan system of 167 schools, a groundbreaking partnership between a school system and a museum institution.

The plan has been accepted by the Catholic Education Office, and emphasizes implementation of two specific hands-on science teaching programs developed by the University of Hawaii, known by the acronyms FAST and DASH. These programs stress use of the inquiry/discovery approach, involvement of students in research, developing basic concepts, and exploring the interrelationships among science technology, environmental issues, and society. Implementation will be aided by a ten-year, $2 million grant to the Archdiocese from the Monsanto Fund.

The Garden is also working to develop a Visiting Scientists Program, which will introduce students to science as a profession. Classroom visits by working researchers and field trips to local laboratories and institutions will help to demystify science and make it a familiar part of daily life.

"This landmark collaboration between a cultural institution and a school system is an exciting development," said Dr. Peter H. Raven, Garden director. "We are dedicated to serving the St. Louis community by making the resources and expertise of the Garden available to educators seeking to improve the quality of science education."

From the Garden Gate Shop

Shop Closed for Inventory

The Garden Gate Shop will be closed for inventory Thursday and Friday, January 2 and 3, and will reopen at noon Saturday, January 4.

January Clearance Sale

Wednesday and Thursday
January 8 and 9, 1992
9 a.m. to 5 p.m.

Bonus savings! Members receive 20% off everything in the Shop including previously reduced merchandise.

Orchid Show and Sale

The annual Orchid Sale kicks off with the members' preview of the 1992 Orchid Show on Friday evening, January 17 and continues until February 16. Members receive 20% off all orchids, orchid bark and fertilizer, and wire accessories.

Valentine's Day

Remember your sweetheart with a colorful blooming plant or one of our charming collection of romantic gifts and cards. The Tower Grove Rose, specially created for the Garden by the Boehm Porcelain Studios, says you care all year long. It is exclusive to the Garden Gate Shop, $175.

Birds and Books

Don't forget that the Garden Gate Shop has a wide variety of bird feeders, bird houses, bird seed and bird books, tapes and videotapes. We also have *The Birding Game*, a new board game based on the field guides of Roger Tory Peterson. A must for birders, $39.95. A delightful book to enjoy this winter is *Yardening* by Jeff and Liz Ball, the complete reference book for everyone who doesn't consider him-or herself a gardener. Macmillan, 256 pages with illustrations and photographs, $24.95.

Plan Ahead For Spring

Pick up your seeds, windowsill greenhouses, peat pots and seed-starting accessories as you plan your spring garden!

Ben Chu of the MBG horticulture staff and Nancy Gooch use the lift to reach unshattered cones of the golden larch, **Pseudolarix amabilis.**

THE LIVING LIBRARY

Garden Plants as Tools for Research

If you visited the Garden on November 7th while snow was on the ground, you may have seen two people up in a tree in a cherry-picker in sub-freezing weather. A little crazy? Perhaps. But one of those people had waited over two years for the opportunity to study and collect the seeds of this tree.

The tree is a golden larch, *Pseudolarix**, from eastern China. Golden larch is considered rare in China and few specimens have been introduced to the United States. The tree climber was a graduate student from the University of California, Nancy Gooch. Nancy is a paleobotanist, a scientist who studies fossil plants. She visited the Garden to examine and collect material from our living golden larch in order to gain insight into the biology of its fossil relatives. Our tree, and several others in St. Louis county, represent a treasure to this researcher; geographically, they are the closest seed-producing specimens to her home base in California!

Our golden larch, a gift in 1953 from The Federated Garden Clubs of America, is situated at the north end of the Museum Building along the eastern wall of the Garden. When the tree was donated, the Garden Clubs knew the tree was rare and valuable, in both a horticultural and an educational sense. But how could they have guessed the value the tree would hold for research nearly forty years later?

Visitors to the Garden will readily agree that the collection of living plants on display is immensely valuable for its beauty; to realize the aesthetic value, one need only visit the Garden in the height of spring, view the roses or water lilies in bloom, or stroll through the green of the Climatron in mid-winter. But many of the plants in the Garden represent much more to a researcher. The living collection is, in many ways, like a library; we never know what kind of plant, or book, we may wish to study in order to gather information.

The living collection has many potential uses in research. Taxonomists from around the world request leaves, stems, or flowers of a particular species in order to study structure or anatomy. The results of those studies can be used to describe or clarify species, or to understand evolutionary relationships. Recent advances in molecular biology allow isolation of genetic material (DNA) from leaves that can then be compared for the same purposes. One taxonomist who visited the Garden collected over fifty different kinds of plants in the lily family, *Liliaceae*, for a comparative genetic analysis of that group.

Plant breeders are looking to living plant collections and botanical gardens for the raw material of their trade—genes. Using the techniques of genetic engineering, a plant breeder can isolate a gene that holds a particular genetic trait in one kind of plant, and then insert it into another plant. Modern plant breeding in crops such as potatoes, tomatoes, and corn rely on genes from wild relatives; "wild-type" genes can confer a desirable trait such as large fruit size or disease resistance.

Pharmaceutical companies are screening a wide range of plant species in the hope of developing drugs to fight disease. For example, the rosy periwinkle from Madagascar, *Catharanthus roseus*, is the source of vincristine and vinblastine, drugs shown to be highly effective against childhood leukemia and other cancers. Our living plant collection at the Garden includes the rosy periwinkle and other species of *Catharanthus* from Madagascar; the other periwinkle species are potentially valuable as sources of similar drugs, or as storehouses of closely related genes that can be inserted into the genetic material of the rosy periwinkle using genetic techniques mentioned above.

And now, conservation biologists are counting on botanical gardens to propagate and maintain endangered species. At the Missouri Botanical Garden, we have living collections of over 21 species of endangered plants from North America through our involvement with the Center for Plant Conservation. We also grow over 100 rare or endangered plant species from other parts of the world. Any of these plants can be studied by researchers to learn more about the species, or could be utilized in breeding or reintroduction programs.

The Missouri Botanical Garden currently maintains a living botanical library of more than 10,000 different kinds of plants. Which plant will be needed for research next week? Next year? Only the future will tell.

—Lucile McCook, Ph.D.,
Horticultural Taxonomist

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*The single species of *Pseudolarix* has been called both *Pseudolarix amabilis* and *P. kaempferi*. It was recently decided, at the International Botanical Congress, to use the name *P. amabilis*.

Volunteers Needed in the Library

The Garden library is seeking volunteers to process archival collections. Processing entails organizing and cleaning documents and photographs as well as creating a description of the collection to aid researchers. Training will be provided by Library staff. For more information call Jeanne McGilligan at 577-5187.

Address by Henry Shaw Medalist José Sarukhán

On October 14, 1991, Dr. José Sarukhán Kermez was awarded the Garden's Henry Shaw Medal at a dinner at the Ritz-Carlton Hotel (see November-December Bulletin*). On that occasion Dr. Sarukhán delivered the following address:*

The effects and influences of the visionary decision of Henry Shaw more than 130 years ago, when founding the oldest botanical garden in the United States, have largely transposed the Tower Grove and Magnolia Avenues in St. Louis.

Indeed, along its history, but particularly in the last two decades, the interest and presence of the M.B.G. has increasingly become ubiquitous on the face of the Earth.

Under the splendid leadership of its present director, the M.B.G. has extended its activities well beyond the purely plant collecting activities to multifaceted studies which geographically cover all the continents and thematically encompass from classical plant taxonomy and floristics, to molecular plant genetics, passing through botanical historiography.

More remarkable still in this internationalization of the Garden's work has been the consistent effort to associate with other academic institutions, particularly those located in the different countries.

I will explain why this is remarkable. First, because a large number of academic institutions often visit foreign countries, especially those which are in a developing process, without any or very little contact with their colleagues in that country, an attitude which besides being in want of civility, precludes the academic interchange among colleagues. But second and most important, because the M.B.G. has followed a philosophy of interacting as intensely as possible with local institutions, not just out of politeness, but with the conviction that they want to interact with their foreign colleagues and if necessary—and this is often the case in many developing countries—help to strengthen or build local capacities, both individual and institutional. I may also add that, at least in my experience, such interaction is carried out in a way which gives its proper place to the academic abilities and expertise of the local colleagues and institutions, making the most of mutual capabilities and resources.

This has certainly been the case with the *Flora Mesoamericana* project, one of the two or three most important floristic surveys now underway in the world. The project is being carried out on the basis of an equal partnership between the National University of Mexico (UNAM), the Missouri Botanical Garden and the British Museum. Ever since Dr. Raven first suggested to me the possibility of putting the project together, the dominant attitude has been one of mutual academic respect and full collaboration. As a result we will be presenting to the public the first volume of the *Flora*. It will be simultaneously another first: the first time that a major floristic study in the world will be published in Spanish. This is not an act of academic eccentricity. It results from the recognition of the role played by UNAM in the project, as well as from the need to attract interest in the Latin American countries covered by the project and stimulate the development of their academic communities and increase their sensitivity to preserve the biological richness in their territories.

You may ask, "Why am I telling you all this?" Surely because I want to underline the international role of the M.B.G. and the basic philosophy to carry this out. But also for another reason. And this is the crucial importance of that kind of international cooperation which has profound consequences on strengthening a country's capacity to develop its own "intelligence" about its physical, social and cultural realities, potentials and limitations. On being able to find for itself the answers to the problems that it faces, to resolve to better the life of its society, and to progress economically and culturally.

This point is in my opinion of medullary importance and will be more so in the present day scenario of increasing globalization of almost all aspects of the life of societies. It will certainly be the case when Canada, the United States and Mexico reach the Agreement for a Free Trade Area. Although the F.T.A. contemplates only—or mostly—trade issues, it is quite clear to me that the long term viability of such an agreement will depend very much on the adequate understanding among the societies of each of the countries, and the reaffirmation of their individual cultures. This will only be possible when clear efforts are made to increase the cultural and educational relations among our countries, to help us understand and appreciate each other's values and characteristics much better than we do now.

And this is why I have stressed the role which the M.B.G. has played in its international activities: namely, the advancement of universal knowledge through the interaction and strengthening of our national scientific and cultural structures.

I have left to the end the portion of the speech in which one thanks for the distinction received. Not because I am of an ungrateful nature, but precisely because of the contrary: I am a bit at a loss to find the right words beyond saying that receiving the Henry Shaw medal is a distinction which honours me deeply. I feel I have achieved very little to deserve it, with all due respect to the good judgment of the Board of the M.B.G., and I feel proud to join the list of very illustrious names of past recipients of the medal.

At this point I recall the case of the Ambassador of a small nation to the UNESCO, who in circumstances similar to mine at this moment, always had two speeches, ready to deliver either one, depending on the circumstances. One was very short and the second longer. The short one was "Thank you;" the longer one was "Thank you, very much." I will use a third version, which is fifty percent longer than the second version of the Ambassador, and will say to the members of the Board of the Missouri Botanical Garden, to Peter Raven and Tamra, and my good friends at the Garden Thank you, thank you very much!

Support for Flora of North America

The Surdna Foundation has awarded the *Flora of North America* project a three-year, $150,000 grant to help cover the expenses of the project's organization center at the Garden, including coordination, outreach, and computerization activities.

In addition, the ARCO Foundation has awarded the Flora of North America project a $25,000 grant to help fund the production of computer-generated maps for the first volume of the series.

Flora of North America is a massive binational project to gather and make available information on all plants growing without cultivation in North America north of Mexico. It is the first reference work ever that brings together information on all North American plants.

CLIFF WILLIS

Members of the National Council (left to right): Janet Poor, Judy Freeman, Angela Campbell, Anne Chatham, Nell Scott, Mary Patterson, Sally Squire, Nancy Brewster, Sadie Gwin Blackburn, Don Falk, Mary Ann Streeter, and Hattie Purtell.

Annual Meetings Held in St. Louis

by Greg Wieland, National Collection Coordinator

For the first time since moving to its new headquarters at the Garden, the Center for Plant Conservation (CPC) held its annual meetings in St. Louis. On October 26-29, 1991, the 21 botanical gardens and arboreta that manage the CPC's National Collection of Endangered Plants held their Annual Meeting of Participating Institutions. The meeting was followed by the Annual Meeting of the CPC National Council, October 30 through November 2.

The 1991 Annual Meeting of Participating Institutions consisted of three gatherings: a one day meeting of the directors of the gardens and arboreta in the Center's consortium, two days of meetings during which the directors were joined by the botanists or horticulturists who implement the Center's conservation programs at the institutions, and finally an all-day workshop on seed management. The purpose of these meetings was to evaluate the growth that has taken place, to identify potential problems and discuss solutions, to help develop policies, and to address needs and identify future directions.

The 65 participants made great progress in the development of guidelines that are critical to the conservation of our nation's rare and endangered plants. The guidelines discussed included appropriate uses of the National Collection, reintroduction of plants back into the wild, and seed management.

Seed banking is often the best way of preserving plant material genetically similar to that in the wild population. An entire day was devoted to presenting the latest ideas, methods, and technologies for managing the seed in the National Collection of Endangered Plants. The Seed Management Workshop, the first such workshop the Center has sponsored, involved presentations and demonstrations by some of the world's experts on seed biology and seed storage. Representatives were present from the USDA National Seed Storage Laboratory; Wakehust Place, the seed storage facility for the Royal Botanical Gardens, Kew, in England; the USDA Agricultural Research Service's Germplasm Resources Information Network; and the Center for Reproduction of Endangered Wildlife. The workshop ended four fruitful days of discussions among the Center's network of gardens.

George Briggs, director of the newest of the Participating Institutions, the North Carolina Arboretum, said, "Our work with the CPC has helped us to establish a much stronger rapport with conservation efforts in our region. That, in turn, helps us in our work of preserving endangered plants. Sometimes, educating people and making them truly *care* about an issue are two different things. Our affiliation with CPC strengthens and helps to validate all of our programs."

These ideas were echoed by Linda McMahan, director of the Berry Botanic Garden of Portland, Oregon. Linda, Bill Brumback of Garden in the Woods, and Brian Parsons of Holden Arboretum, who have all worked with CPC since its beginnings, explained that CPC has worked hard to build a sense of partnership with other conservation organizations throughout the country.

"Moving to St. Louis has been a wonderful boost for the CPC," Linda said. "We all feel a renewed sense of commitment, a sense that our organization has matured and is ready to move ahead in our efforts to conserve the native flora of the United States."

Then the annual meeting of the Center for Plant Conservation's National Council commenced. The National Council delegates, who like the Center itself represent all regions of the country, met from October 31 to November 2. They outlined their work with the Center and its Participating Institutions, including the Missouri Botanical Garden, to spread the word of the Center's work, to develop a membership program, and to keep donors informed of the conservation work being done with the endangered plants they have sponsored. Sally Squire, president of the National Council, said, "Big goals start with small actions. We're excited about putting our plans into action!"

CLIFF WILLIS

Directors of CPC affiliates (left to right): Dr. Peter S. White, The North Carolina Botanical Garden; Dr. William Theobald, National Tropical Botanical Garden; Dr. Linda R. McMahan, Berry Botanic Garden; Dr. Peter H. Raven, MBG; Lee Ann Toles, Mercer Arboretum; Dr. George Briggs, The North Carolina Arboretum; Wayne A. Hite, The Arboretum at Flagstaff; Dr. Robert G. Breunig, Desert Botanical Garden; Mary Pat Matheson, Red Butte Gardens and Arboretum; Dr. Arthur Ode, The Nebraska Statewide Arboretum; Dr. Simon Linington, manager of the Seed Bank at Wakehurst Place, Kew; and Donald A. Falk, director of CPC.

Herb Society Celebrates 50th Anniversary

"Spice is the variety of life."—Terry Doughty

The St. Louis Herb Society capped a year-long celebration of its golden anniversary with a dinner at Spink Pavilion on November 16, 1991. The Society was founded in February, 1941, at the Garden to promote "the use and knowledge of herbs" and it became the first volunteer group to maintain a special interest plant collection at the Garden. With staff cooperation, the Society designs, plants, and maintains the exquisite fenced Victorian garden behind Tower Grove House.

The year-long celebration, chaired by Pat Leigh, featured a series of sold-out lectures and demonstrations with proceeds benefitting the Garden. These programs included lectures on herb lore and propagation, a workshop on making herbal topiaries and wreaths, and the preparation of an herbal holiday dinner. In June, Joyce Niewoehner, president of the Society, presented Dr. Raven with a check for $5,000 in honor of the anniversary. Part of the gift was used to sponsor a presentation by Garden researcher Dr. Mick Richardson at a horticultural conference at Kew Gardens, London.

The Herb Society holds programs every year in cooperation with the Garden's Education division and the Speakers' Bureau. Members have produced two books, *How to Grow Herbs in the Midwest* and *The Lore and Legend of Culinary Herbs and Spices.* The books, plus a special curry powder created by Society members, are for sale in the Garden Gate Shop.

Membership in the St. Louis Herb Society is limited to 60 active members whose interests range from propagating and growing herbs, cooking with herbs, herb garden design, historical uses of herbs and herbal love, to cooking, dyeing, and making decorations and crafts with herbs.

"The activities of the Herb Society have enriched the Garden immeasurably," said Dr. Raven. "We are indebted to the members for making the Garden a more delightful place, and look forward to another 50 years of collaboration!"

Garden Establishes Cultural Diversity Council

On November 20, 1991, the Garden's Board of Trustees adopted a resolution establishing a new Diversity Council at the Garden, which "will act to eliminate racial and ethnic polarization and will increase multi-cultural representation and participation in programming, audiences, membership, employment, volunteers, contracts and purchasing."

O. Sage Wightman III, president of the Board of Trustees, said, "Under Peter Raven's leadership, Missouri Botanical Garden has long had a strong affirmative action and equal opportunity employment program." Dr. Raven added, "as we seek to carry out the Garden's mission in a spirit of excellence and equity, we want the Garden to take advantage of potentially enormous benefits in problem solving, creativity and marketing to our diverse community . . . toward that end I have asked Sue Wilkerson, our director of Human Resource Management, to organize a committee that will be staffed by blacks and whites, managers and non-managers."

Sue Wilkerson said, "The effective management of diversity offers a competitive business advantage and increasingly will have a significant impact on an organization's success. 1990 census figures show that African-Americans comprise 48% of the City and 14% of the County." Wilkerson, who earlier organized a two-day retreat on behalf of the St. Louis Area Museum Collaborative (SLAMC) added, "Minority representation in the SLAMC institutions is disproportionate to the population. On average, 7% of board members and about 20% of museum employees are African-Americans. SLAMC has been working steadily throughout the community to increase minority participation in local cultural institutions. We are indebted to our volunteer advisory board for their contributions: Zella Harrington of the American Red Cross; Wyndel Hill of Wyndel E. Hill & Associates; Lee Jeffries of Pepsi-Cola Bottling Company; Clyde Orr of Metropolitan St. Louis Sewer District; Ronald Pointer of Saint Louis University; and Sheila Bouie-Sledge of Goodwill Industries."

In conclusion, Wilkerson commented that the Garden committee will be established and fully in place by January, 1992.

In its resolution, the Garden's Board of Trustees pledged to "commit to achieving the full pluralistic potential of the Missouri Botanical Garden by embracing the diversity of our society and by reflecting it in all activities and at all levels."

Volunteer Profile *Henry Bowman*

LIZ BALL

Sometimes a volunteer becomes so much a part of the Garden it is impossible to imagine how the place would function without him. Henry Bowman has been a daily volunteer in the production greenhouses since 1977, and the staff has learned to rely on his dependability and inventiveness.

"If we need to figure out a new way to do something, Henry invents a solution," said Tina Pey, staff horticulturist. "He is always coming up with tools and techniques for displaying and maintaining the plants indoors and out."

Henry was born in 1903 and has lived in St. Louis all his life. After a 3½ year stint in the Navy he worked as a pipefitter and welder with Union 562 for 55 years. He has received honors for his Garden service, including a ten-year recognition award in 1987 and the Special Services award in 1982. He faithfully gives six or seven hundred hours a year to the Garden.

In September the Garden Writers Association of America held their annual meeting at the Garden, and photographer Liz Ball took this photograph of Henry after he showed her the orchid collection. Henry says that the only other time he had his picture taken was at the police station, and that one wasn't worth publishing. We doubt it, Henry!

President of Chinese Academy of Sciences Visits Garden

RICHARD BENKOF

Prof. Zhou (left, with Peter Raven) at a dinner at the Garden on November 4, 1991.

Professor Zhou Guang-zhao, president of the Academia Sinica, Beijing, People's Republic of China, visited the Garden in November. Academia Sinica is one of the highest science policy-making institutions in China and is one of the largest scientific research organizations in the world, encompassing over 300 research institutions, a university, graduate school, and Science Press, publisher of the *Flora of China*.

The Academy provides important support for the *Flora of China* project, a joint venture headquartered here at the Garden. Dr. Zhou is one of the highest ranking Chinese ever to visit St. Louis. He has appointed Dr. Peter H. Raven, director of the Garden, to serve as a co-chairman of an international committee for the protection of biodiversity in China.

Tower Grove House Holiday Decorations

The beautiful Victorian decorations in Tower Grove House at the holidays were installed by dedicated volunteers as a gift to the Garden and the community. We are deeply grateful for the efforts of the following organizations and individuals.

Very special thanks go to Mrs. Fred W. Wenzel. Our appreciation also is extended to the Four Winds Garden Club, Garden Club of St. Louis, The St. Louis Herb Society, Grass Roots Garden Club, The Members' Board of the Garden, Ladue Garden Club, Fleur de Lis Garden Club, The Historical Committee of the Garden, The Tower Grove House Auxiliary, and Joan Abeln.

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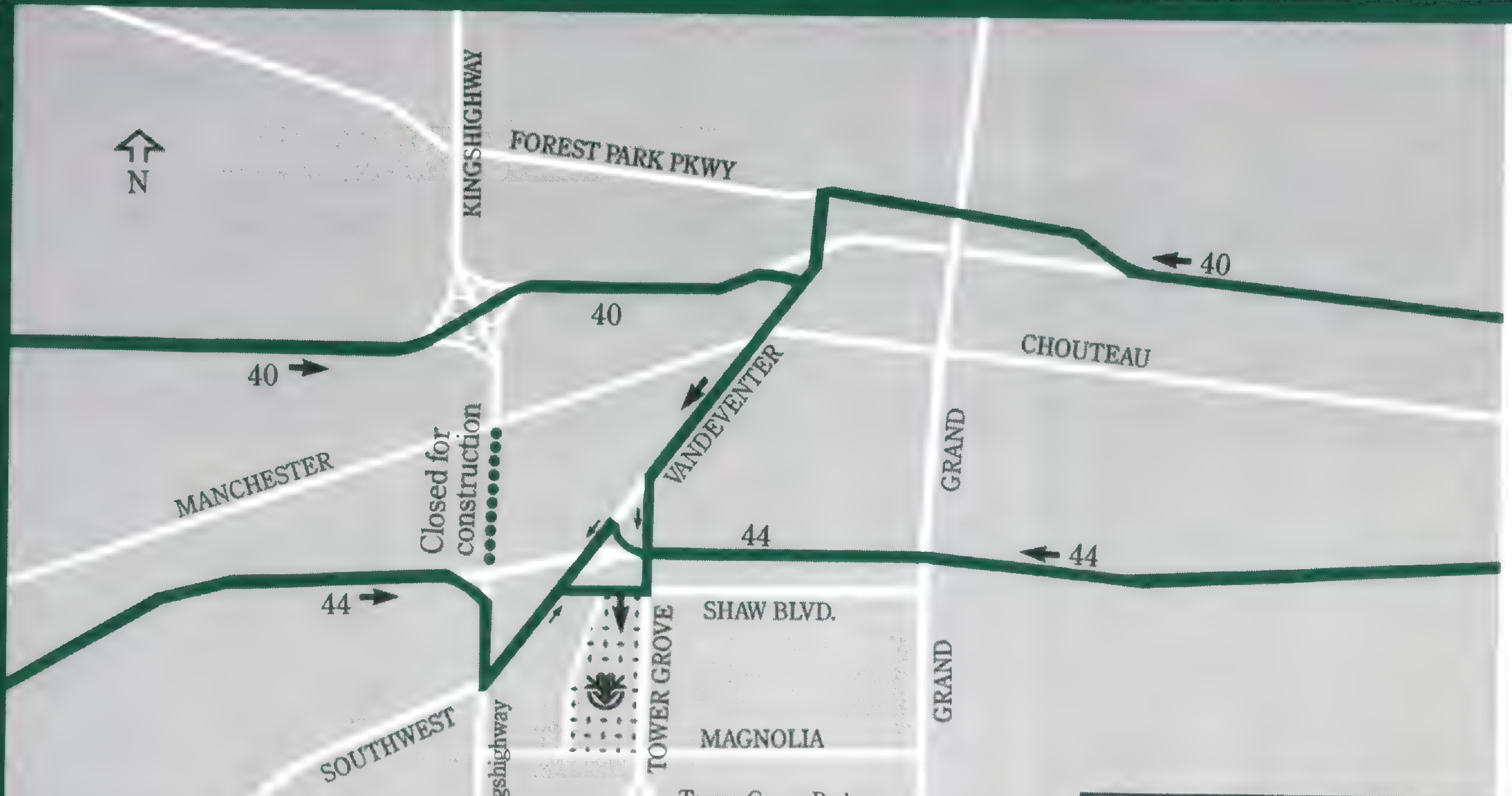
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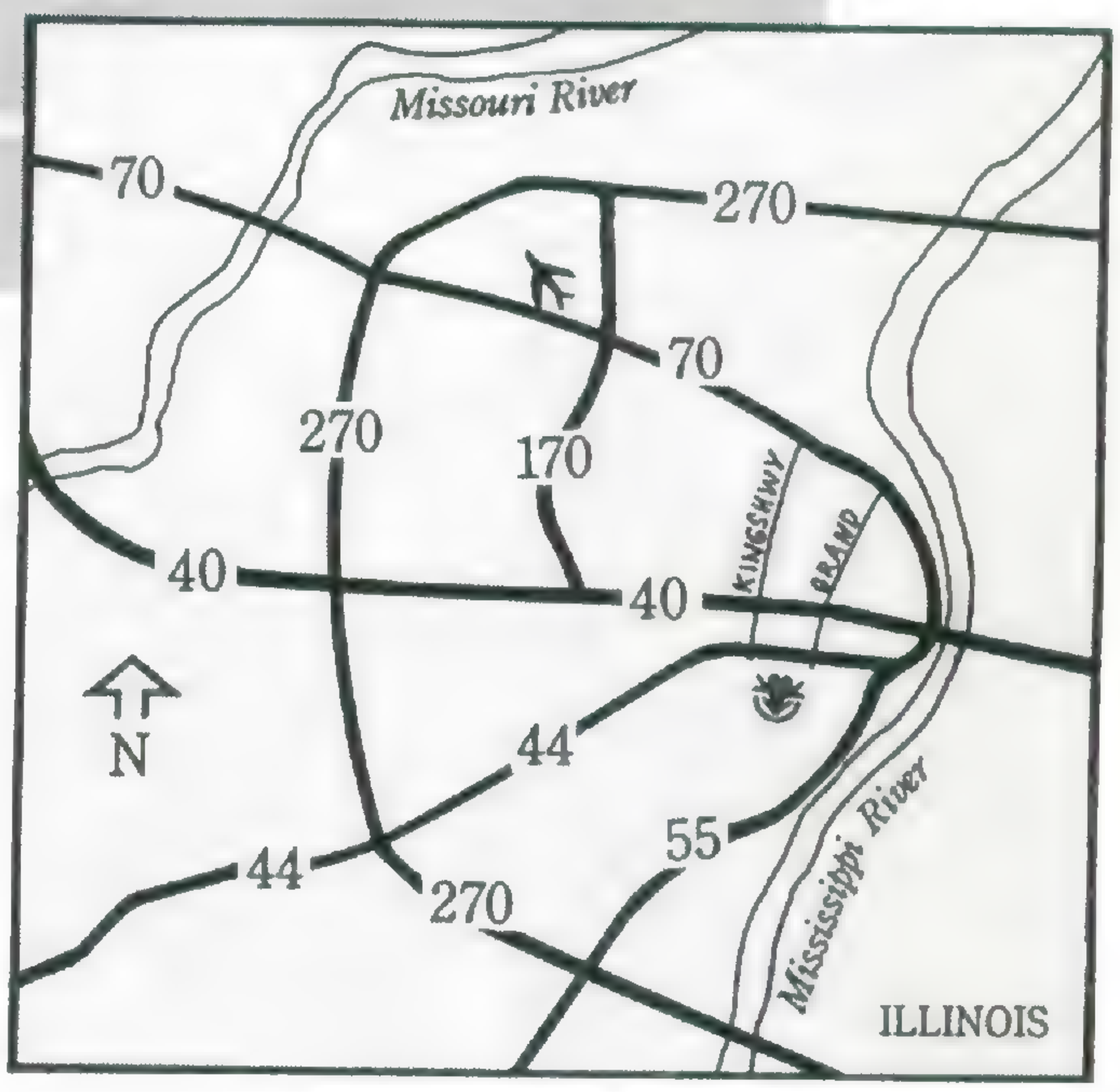
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Kingshighway Viaduct Closing

The Kingshighway Viaduct, bridging a span of roadway from immediately north of McRee to just south of Manchester, will be closed by the City of St. Louis in the spring of 1992. The entire structure will be dismantled and a new viaduct will be constructed. City engineers estimate the project will take approximately two years to complete. Members, volunteers, employees and visitors to the Garden will need to find new alternate routes as illustrated in the map above. Please save this map for future reference. The City will announce the date of the closing of Kingshighway in early 1992. Watch the newspapers and broadcast news for information on the specific dates. The Garden regrets any inconvenience members and visitors may experience during this period.

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Missouri
Botanical
Garden

Bulletin

MARCH /
APRIL
1992

OLUME LXXX
UMBER TWO

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Photo by King Schoenfeld

1992 Missouri Botanical Garden.

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The BULLETIN is sent to every Member of the Garden as one of the benefits of membership. For a contribution of as little as $40 per year, Members also are entitled to: free admission to the Garden, Shaw Arboretum, and Tower Grove House; invitations to special events and receptions; announcements of all lectures and classes; discounts in the Garden Gate Shop and for course fees; and the opportunity to travel, domestic and abroad, with other Members. For information, please call (314) 577-5100.

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Comment

Spring Events

The extremely mild winter season has not lessened our anticipation of spring and the beautiful garden displays that never cease to delight us. In addition to the always colorful garden displays, many exciting events and projects have been planned throughout spring that warrant your participation and awareness.

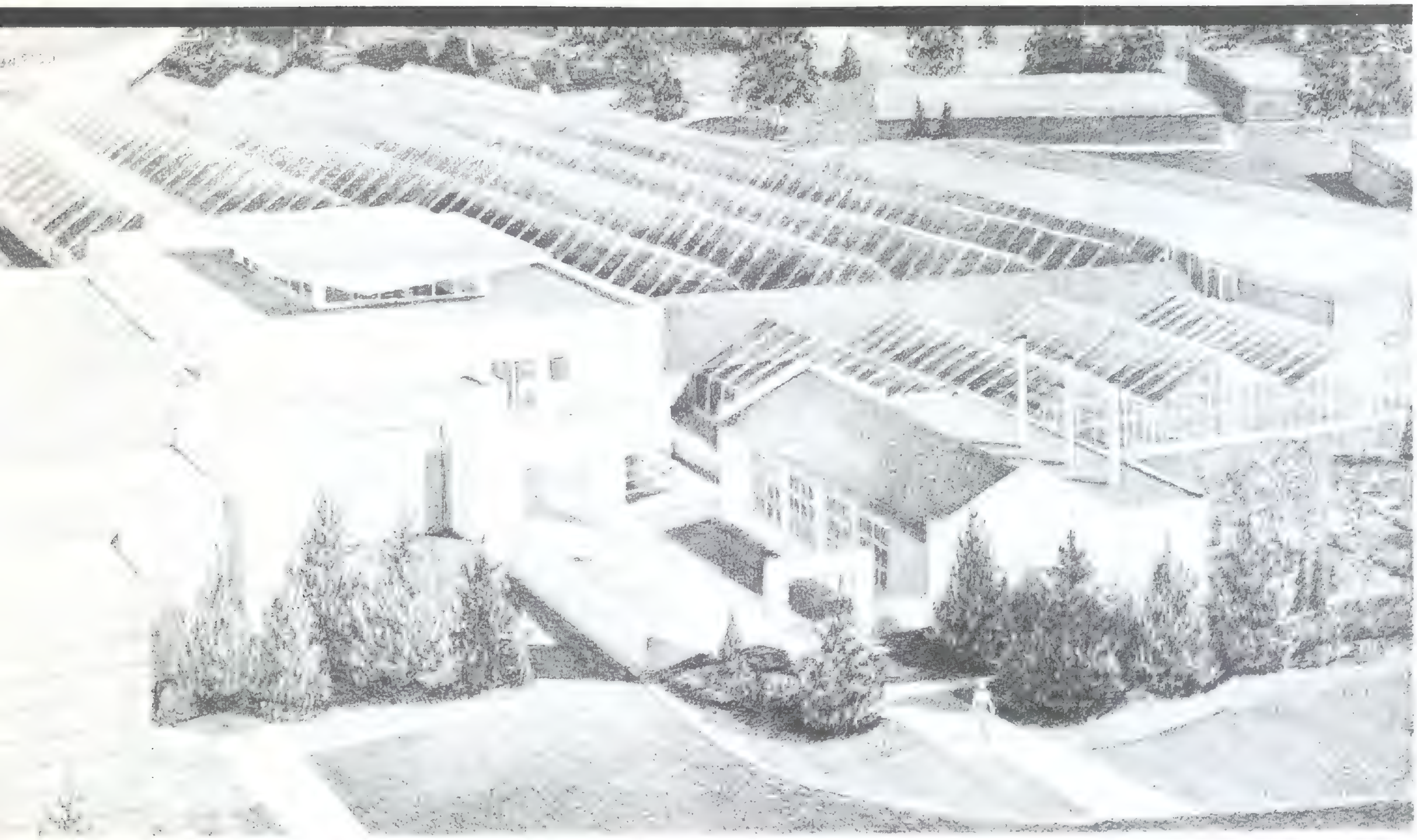
With a great deal of enthusiasm, I want to call your attention once again to the Smithsonian Institution's traveling exhibit, "Tropical Rainforests: A Disappearing Treasure", now on display through April 5 at the St. Louis Science Center. We are pleased to have joined with the Science Center, the Saint Louis Zoo, and KMOV-TV Channel 4 to sponsor this extraordinarily meaningful exhibit. I encourage you to take advantage of the many companion programs at all three institutions planned in conjunction with the exhibit. In particular, if you have wondered about our collection of plant specimens, and how these plants from throughout the world are preserved for research purposes, meet Garden research staff on March 27—**Final Friday**—in the Climatron and Brookings Interpretive Center for an informative demonstration. You will be fascinated!

News of the $500,000 challenge grant from the Kresge Foundation for the new Conservation Center is most welcome indeed! This award is a marvelous boost to our efforts and will certainly help us move forward in a productive manner. The Kresge Foundation has been a substantial friend of the Garden through several significant development projects. The Foundation's investment in this current effort (see page 3), along with the commitment and support by our members, will make it possible to complete the Conservation Center within the next 12 to 18 months.

Please join us for activities planned over the next few months. The popular "Gardening by Design" lecture series each Tuesday throughout March, the Members' Preview of the Spring Flower Show on March 6, the April Members' Day at Shaw Arboretum, informal spring wildflower walks during April and May at the Arboretum, are just a few of the many reasons to turn your attention to spring at the Garden.

Peter H Raven

Dr. Alwyn H. Gentry (left) was honored at a Garden staff meeting on January 29, 1992 for twenty years of service at the Garden. He is congratulated here by Dr. Marshall R. Crosby, assistant director, who presented Gentry with a framed print by artist Margaret Mee.



Above: An artist's rendering of the proposed building to be constructed west of the Ridgway Center.

Kresge Foundation Awards $500,000 Challenge Grant for New Conservation Center

A NEW Conservation Center at the Missouri Botanical Garden is closer to realization thanks to a $500,000 challenge grant made by The Kresge Foundation of Troy, Michigan.

The new 11,300 square-foot Center, resulting from the renovation and expansion of a small existing structure, will house the Garden's horticulture division and the national headquarters of the Center for Plant Conservation (CPC), the United States' first and largest organization devoted exclusively to the preservation of endangered native plant species, which relocated at the Garden in early 1991. In addition, the Conservation Center will provide facilities for community groups dedicated to gardening and environmental management, such as St. Louis Gateway to Gardening. Plans call for construction to begin this spring and conclude within a year.

The Kresge Foundation's award, designated for construction, is part of a larger two-year, $3.38 million drive triggered by the CPC's move to the Garden. Under the terms of the Kresge grant, by June 1993 the Garden must still raise an additional $1 million for the building project and $575,000 in CPC operating and endowment funding.

''We deeply appreciate this generous grant to help us provide superior space for staff and colleagues working in plant science and environmental conservation,'' said Dr. Peter H. Raven, director of the Missouri Botanical Garden. ''The Kresge Foundation has issued a very important vote of confidence in our ability to succeed, which will be instrumental as we work with our Members and donors during the challenge period.''

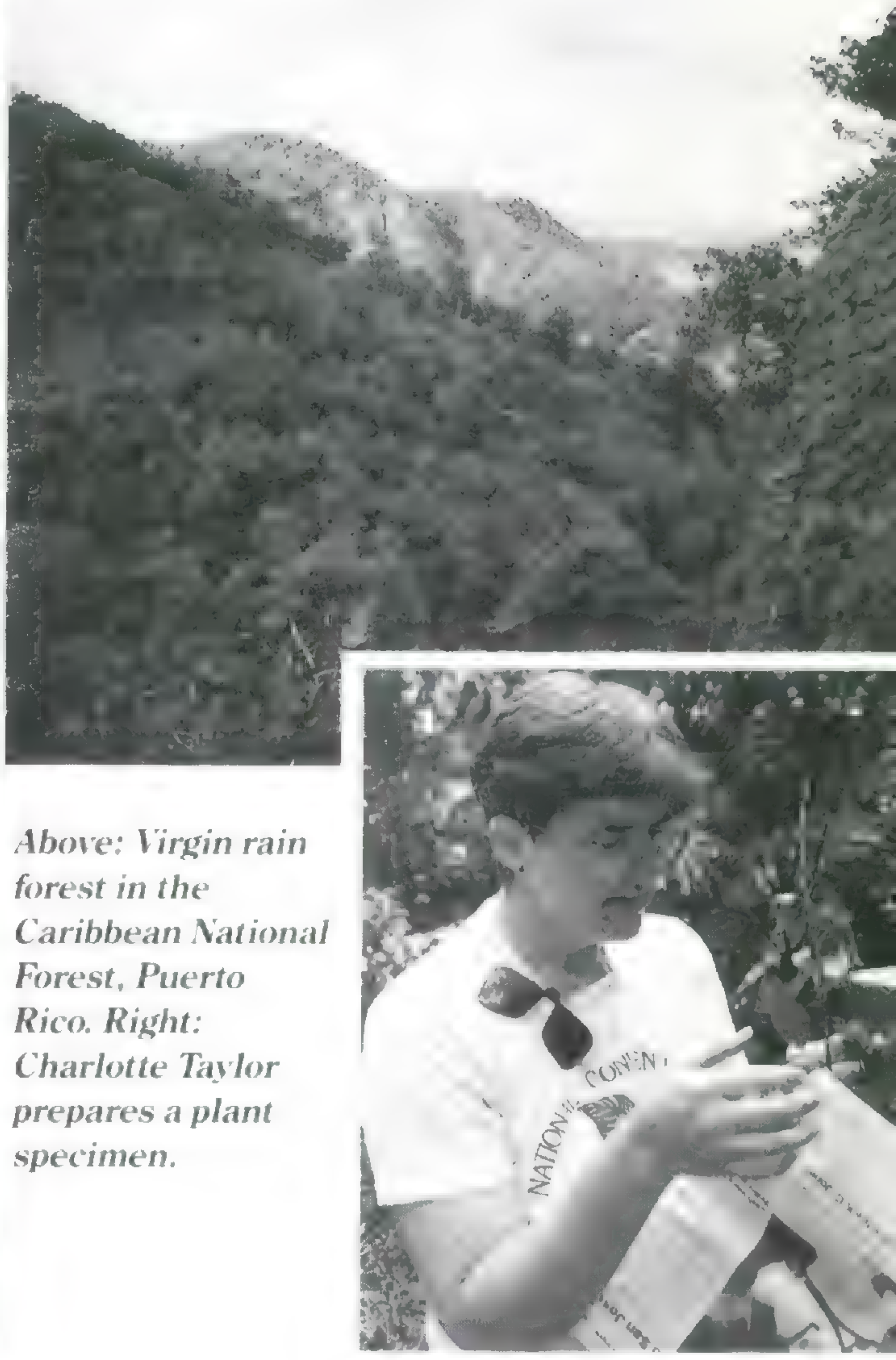
''Fund raising is moving ahead on both fronts, but we still require significant support for the construction effort,'' added Marcia Kerz, the Garden's director of development. ''We urgently need to reach our goals by the June 1993 deadline in order to receive the $500,000 award.

''In the past fifteen years, Garden Members and St. Louis community residents have played key roles in three other successful Kresge Foundation challenges: for the construction of the Ridgway Center, the renovation of the John S. Lehmann Building, and the recent renovation of the Climatron. We very much hope we can count on their positive response to this need as well. We have set a Members' participation goal of $139,000 and will be sending a letter in March that explains the project and asks for their support.''

The Kresge Foundation is an independent, private foundation created in 1924 by the personal gifts of Sebastian S. Kresge. It is not affiliated with any corporation or organization. Since the Foundation's creation, more than $800 million have been distributed to thousands of deserving organizations to assist them in raising funds for projects involving facilities construction, renovation, or the purchase of major capital equipment or real estate.

MISSOURI BOTANICAL
MAY 6 1992
GARDEN LIBRARY

Larry Connors (left), KMOV-TV anchorman, with MBG research scientist Jim Miller in the Caribbean National Forest during filming of the television special.



Above: Virgin rain forest in the Caribbean National Forest, Puerto Rico. Right: Charlotte Taylor prepares a plant specimen.

Rescuing the Rain Fores

The St. Louis Connection

By Charlotte Taylor, Ph.D.

IN the dark undergrowth of the Caribbean rain forest, only a rustle of leaves betrayed the presence of Larry Conners, KMOV-TV news anchorman. Executive producer Al Frank and videographer Tom Newcomb peered through the lush vegetation trying to spot him.

''Are you okay?'' Al Frank called.

''Just fine, although there's a big black snake by my foot,'' Larry replied. ''But he doesn't seem to be going to bother me, so let's go ahead with the filming.''

The KMOV-TV Channel 4 team was on location in the tropical rain forest of Puerto Rico for the preparation of an hourlong documentary ''Rescuing the Rainforest: The St. Louis Connection,'' which will air in prime time during late February or early March. This documentary is a cooperative project among Channel 4, the Garden, the Saint Louis Zoo, and the St. Louis Science Center. It will be broadcast to complement the Smithsonian Institution's travelling exhibit ''Tropical Rainforests: A Disappearing Treasure'' on view at the Science Center through April 5. The television program highlights the activities of local St. Louis institutions in tropical conservation.

And the activities of our local institutions are significant. St. Louis is a nationally recognized center for scientific research and education, including tropical biology and conservation. The Garden is one of the world's most active institutions in tropical botanical research. The Saint Louis Zoo is an important center for captive breeding of endangered tropical animals. Both institutions collaborate closely with programs of graduate study at Washington University, Saint Louis University, and the University of Missouri-St. Louis (UMSL), including the new graduate program in Tropical Conservation Biology at UMSL. And the St. Louis Science Cente is a unique facility for education of both the general public and sch classes in issues related to science, including the importance and plight of tropical rain forests.

Although tropical rain forests cover only seven percent of the Earth's surface, they contain more than half of the world's plant a animal species and are disproportionately important in moderating the world's climate and atmosphere. Under current human pressu the rain forests are being destroyed rapidly, with an area the size Illinois eliminated every year. This will result in their virtual disappearance—along with their plants and animals—by the year 2050.

The KMOV-TV team was accompanied to Puerto Rico by Dr. Jim Miller and Dr. Charlotte Taylor of the Garden, and Zoo Deputy Director Roger Birkel. Jim Miller coordinates the Garden' natural products research programs, and has made two previous trips to the island collecting for the Garden's collaborative program with the Monsanto Company, searching for new plant derived mec cines. Charlotte Taylor was a professor of botany at the University of Puerto Rico-Rio Piedras before coming to the Garden. During t four days of taping, the team visited the Caribbean National Forest—the only tropical rain forest in the National Forest system, and an international center for research and conservation—and several of Puerto Rico's Commonwealth Forest Reserves.

Tropical forests provide the world, including St. Louisans, with many important products. ''About 25 percent of currently markete pharmaceuticals are derived from plants,'' Jim Miller says, ''and in developing countries—mostly tropical—reliance on plants is much greater. Ninety percent of Africans depend only on the forest for their health care. And while people may realize that the plants and

Left: A view at the edge of Toro Negro Commonwealth Forest Reserve, showing private land cleared from the rain forest for pasture.

Above: Occasional residential dwellings appear in forested areas. Left: Rio Turabo, one of many mountain rivers in the region.

mals are threatened, they seldom think of the tropical soils: when forest is cut, the nutrient-poor soils become hardened and rile, and unable to sustain the growth of plants or micro-anisms. In addition to the importance of plants as food and rmaceuticals, about 9,000 medicines currently marketed in the . are derived from micro-organisms.''

Tropical rain forests moderate the world's climate, both temper-re and atmosphere; when they are destroyed, the vegetation that laces them is much less effective. And, in addition to medicines, pical forests provide us with timber and many of our daily foods, h as coffee, tea, sugar, and citrus fruits. As the rain forests disap-r, potential new foods and medicines disappear with it.

KMOV-TV's documentary will focus on the nature and impor-ce of rain forests, and on what steps St. Louisans can take to ure the preservation and continued existence of the tropical rain ests. Teacher's Guides for school study programs to accompany Smithsonian exhibit and the documentary will be available ough the education departments of all three collaborating institu-ns. Interested educators may call 577-5140 for more information. the rain forests continue to be destroyed at an alarming rate, we need to act so that their beauty, marvels, and economic potential be enjoyed by future generations.

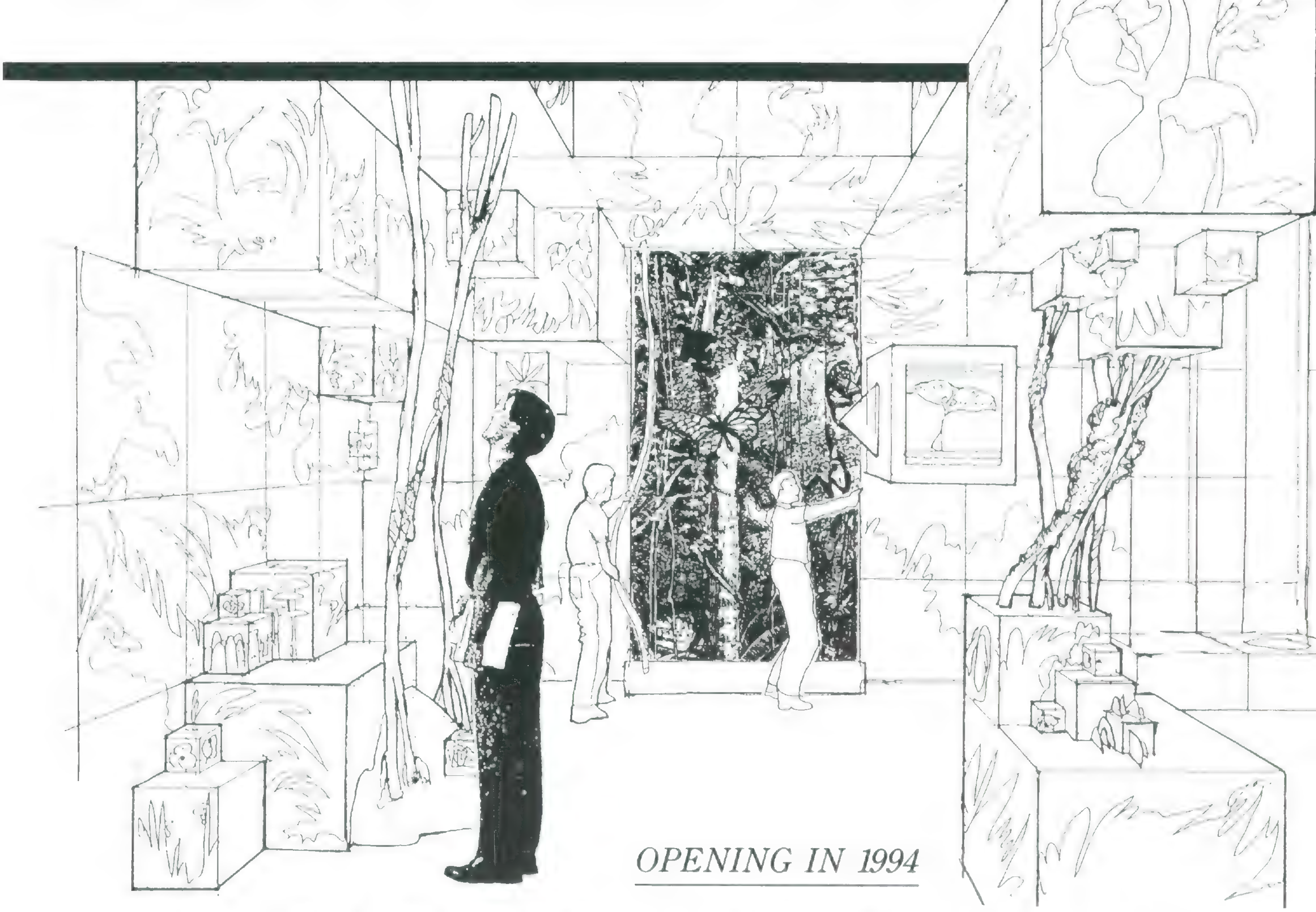
aven Receives Honorary Degree from Argentina

Dr. Raúl Matera, Secretary of Science of Argentina (left), with Dr. Peter H. Raven.

During a visit to Argentina December -11, 1991, the Garden's director, Dr. Peter I. Raven, received a Doctor Honoris Causa degree from the Universidad Nacional de La Plata. The University presents the degree to outstanding individuals in the fields of science, culture or education. Former recipients include Abdus Salam and Carlo Rubbia, past winners of the Nobel Prize in Physics, and the well known North American paleontologist George G. Simpson.

The Universidad Nacional de La Plata was founded at the beginning of this century and has the greatest concentration of scientists in Argentina. Dr. Angel Plastino, president of the University, presented the honorary degree to Raven at a public ceremony where Raven delivered an address titled ''Biological Extinctions: A Global Crisis.''

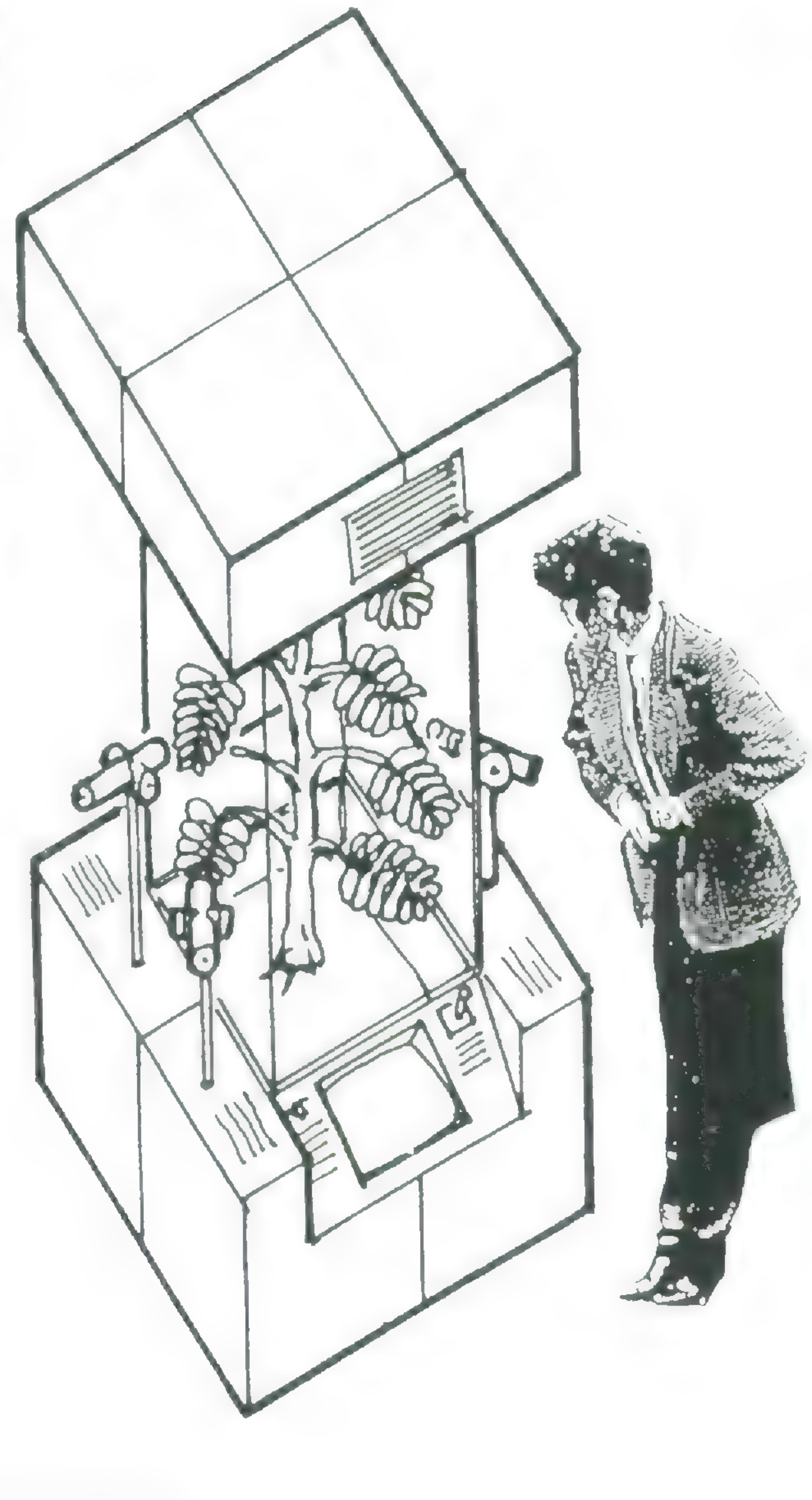
During his visit to Argentina Dr. Raven was made corresponding member of the Academia Nacional de Ciencias Exáctas, Físicas y Naturales in a ceremony at the Instituto Darwinion, one of the leading botanical institutions in Latin America. Raven also met with Dr. Raúl Matera, Argentina's Secretary of Science, to discuss topics of mutual interest and to sign a cooperative agreement between the Garden and Argentina, a major new undertaking. Watch upcoming issues of the *Bulletin* for more on this project.



OPENING IN 1994

Exhibits Planned for Brookings Center

Above: Explore the rain forest from forest floor to the top of the canopy with lighted murals, models of plants and animals, sights and sounds. Right: Investigate ways that plants and animals interact in a living display of ants and acacia plants.



THE National Science Foundation has awarded the Garden a grant o $731,000 for preparation of educational exhibits in the Brooking Interpretive Center on the Tropics in the Climatron complex Already underway, the new exhibits will be installed by the spring of 1994.

“There has never been an exhibit like this at a botanical garden before,’ said Dr. John MacDougal, manager of the Climatron. “We are designing i to help people understand the interrelationships of plants and the natura world. Visitors will learn more about rain forests and plants that they see i the Climatron, plus desert and temperate habitats, and how they all relat to the natural sciences.”

The exhibits are being developed by MacDougal and Dr. Larry DeBuhr director of education at the Garden, in consultation with Krent/Paffet Associates of Boston. Dr. Lucile McCook, the Garden's horticultural taxonomist, was involved in the preliminary planning and will assist with the design and final evaluations of the exhibit. Members of the Garden' research division are also collaborating on the project.

The Brookings Center, which links the Climatron to the Shoenber Temperate House, was constructed through the support of relatives of the late Robert Somers Brookings, the prominent 19th century St. Louis businessman and philanthropist. In recognition of this critical funding, each of the Center's seven principal exhibit areas will be dedicated to a family group.

Visitors entering the Interpretive Center will be greeted by the existing diorama display of tropical forest destruction. As visitors walk clockwise into the Center they will enter a magical world that moves from one natural habitat to another.

A desert biome, or biological area, will be followed by a tropical rain forest biome featuring exhibits and panels that transport the visitor into the different layers of the rain forest understory and canopy. Water columns compare rainfall in tropical and temperate areas, and a colony of living ants and acacias illustrates the interactions of plants and animals in the forest.

A large area will be devoted to global ecosystems, demonstrating the roles played by climate and geographical factors. Seasons, ozone depletion, global warming, acid rain and the greenhouse effect all will be presented. Global weather patterns will appear on "This Hour's View," a big screen satellite down-link that shows cloud patterns live from around the world. Exhibits on temperate biomes will highlight biodiversity and the differences and similarities between temperate forests and the tropics. Trees will be featured as "oxygen machines and water pumps," and the unique features of tropical forest soils will be explained.

An exciting feature of these exhibits will be live demonstrations and educational activities. Education staff will be able to make science come alive for children and adults with interactive demonstrations and equipment mounted on three portable carts, made possible in part by a generous grant from the McDonnell Douglas Foundation. This project will be featured in an upcoming issue of the *Bulletin*.

"The Tropical Rain Forest at Risk" exhibit area explains the causes and consequences of deforestation, featuring a "Rain Forest Countdown." A "Botanist's Tableau" will portray the history of rain forest study and plant exploration and the roles of researchers in today's environmental crisis. Students will see what botanists actually do, and investigate career opportunities in science.

Perhaps the most important section of the exhibit is titled "What You Can Do." Interactive displays show the impact of each individual's personal actions on the local environment and how small steps can help. The emphasis of these exhibits is on positive solutions: sustainable use of resources, successful conservation programs, and changing attitudes.

The Brookings Center exhibits are being carefully designed in modules to make them easy to update. "Every year we plan that at least 10 percent of the exhibit will be fresh and new," said MacDougal. "There will always be something different to see and learn."

Dr. Peter H. Raven, director of the Garden, said, "We are very enthusiastic about enlarging the educational opportunities for all visitors to the Garden. We are very grateful to the National Science Foundation and we look forward to opening this facility in 1994."

Facing Tough Times

The financial climate during the past year has been difficult for almost everyone locally and nationally. As we enter 1992, we face tighter finances at home and in business. This has brought tough choices in every area of our lives: plans have had to be postponed, and dreams have not come true as quickly as we hoped.

As a member of the St. Louis community, the Garden faces the same pressures and constraints. Often this is hard to understand and appreciate, for the Garden continues to announce regular progress with its programs, and to visitors the grounds continue to look impressive and beautiful. Elsewhere in this *Bulletin* are stories about large grants the Garden has received to pursue its projects.

But the actual financial situation at the Garden is more complex. Large grants from major national foundations and government agencies are awarded primarily to support specific scientific or educational projects, not general operations. An institution as large as the Garden requires constant care, and many of its programs do not receive outside support. In 1992 the Garden's director, Dr. Peter H. Raven, faced with the compelling challenge of increased interest and use of Garden programs and slower growth in general operating funds, mandated a significant decrease in the operating budget of all Garden divisions.

For an institution that already operates as efficiently as possible, this means cutting needed programs and services. The effects will be felt by everyone who visits the Garden. "We have made a commitment not to cut staff," said Dr. Raven. "The budget cuts will not reduce the quality of the Garden's programs, but they will affect the quantity and scope of what we can do."

> *For our efforts in research and education, additional support is essential.*

In education, division director Larry DeBuhr agreed that the Garden will not be able to offer as many programs, and outreach programs will not be able to serve as many students. The cutbacks also make it completely unrealistic to handle the increased demand from school classes. Presently, 50 percent of the education class requests are turned away due to lack of funds and space to handle them. It will remain difficult to undertake any special projects. Specific additional cutbacks include Science & Technology Week activities, the Parent Teacher Organization open house, upkeep on the Suitcase Science kits, and mailing requested educational materials to teachers.

The horticulture division is facing some of the most visible effects of a tight budget. Dr. Shannon Smith, director of the division, estimates that the harsh early winter of 1991-92 damaged many plants, especially roses, and there are no funds to replace them this year. There are no funds for emergency tree maintenance, or for employee training. The Kemper Center may not be able to mount any displays for several months, and the number of adult education courses may be curtailed. Flower shows may be scheduled to run fewer days, to save the cost of replacing expensive display plants.

In research, the situation is always critical. For every large grant received, a dozen other projects remain unfunded. The critical nature of the Garden's role in the world environmental crisis means that more work is always needed. "We do everything we can with the money we can raise, and it's still a drop in the bucket," said Dr. W. Douglas Stevens, director of research. "The tropical forests are disappearing faster than we can explore and study them, and all of those plants and animals are lost to us forever."

Marcia Kerz, director of development for the Garden, says, "It is hard to say to our members and the people of St. Louis that we need more money—we look very successful, and the Garden *is* successful. But it also is hard to tell people that we can't provide everything they are used to getting from us, and the fact is, we cannot. We are doing everything we can to ensure the quality of the Garden's programs, but there is not enough financial support to cover program needs."

Kerz continued, "We continue to need the help and support of the members and the community. We are truly at a crossroad. To maintain this institution as a world-renowned botanical garden and to respond to the serious need for greater efforts in research and education, additional support is essential."

PROFILE

Dr. Thomas B. Croat, P.A. Schulze Curator of Botany

Tom Croat in the greenhouse with the Araceae collection.

The Araceae, or Philodendron family, is an extremely large, diverse, and poorly known group. Some of the plants, known as aroids, are very familiar as houseplants, including caladium, anthurium, dieffenbachia, calla lily and philodendron; the colorful poster in the Garden's 1992 calendar featured this family. The Garden's senior botanist, Dr. Thomas B. Croat, who was the major contributor to the poster, is one of the world's leading experts on Araceae. Thanks to him, the Garden has the largest resource in the world for the study of Araceae.

Croat joined the Garden staff in 1967 after receiving his Ph.D. in botany from the University of Kansas. At that time he was one of only four botanists at the Garden; today the number is closer to 50. From self-styled quarters in the unfinished basement of Henry Shaw's old townhouse addition, now the Administration building, he has moved to the modern Lehmann Building, along with most of the Garden's research staff. While he misses the uninterrupted study time of the old days, he is pleased with the expansion of the Garden's research program. "Without question we have a lot more prestige now," he says.

In 1970 he moved to Panama to work on the *Flora of Barro Colorado Island*. The Flora, published by Stanford University Press in 1978, was hailed as a model for future flora writers. While in Panama he helped found the Garden's field station and herbarium at Summit Garden, where he served as curator.

> *Thanks to Tom, the Garden has the largest resource in the world for the study of Araceae.*

It was in Panama that Croat became interested in the Araceae family. There were no experts on this complex family and the information available was very confusing. Even after decades of study on his part, "it is unquestionably the most poorly known family of its size of any plant family in the tropics," he says.

Croat attributes the lack of specialists in Araceae to the difficulty in studying the plants. They tend to be very large and often grow high up in trees, making them more difficult to collect and describe. Also, aroids are generally succulent and fleshy, which makes it difficult to prepare useful herbarium specimens, since the plants look very different when pressed and dried. To deal with the problem, Croat has built a huge collection of living aroids that are cultivated in the Garden's research greenhouses.

This requires a lot of field work. Croat has averaged over two months in the field every year for the past 25 years. He collects not only dried samples but fresh stem cuttings as well. These he transports back to the Garden for cultivation and future study. The live specimens provide a much broader opportunity for scientific research. For instance, Croat can study the flowers of a live specimen that may not have been in flower when it was collected. Croat has collected over 72,000 numbers and his living collection includes about 6,000 plants, the largest aroid collection of its kind in the world.

When doing field work, Croat frequently works alone. "I find that working alone in the field is much more efficient," he says. "There are fewer distractions and fewer interruptions." It is this quest for efficiency that led him to invent the world's only portable plant dryer.

When working in Madagascar in 1975, he became frustrated with driving back and forth to the capital to dry plant specimens. With materials available in the capital, he rigged up a propane-fueled plant dryer in the back of his rented Land Rover. Unfortunately, his new dryer tended to burn plants.

When he returned to the U.S. Croat built a more elaborate and effective fire-proof portable plant dryer in the back of his pick-up, using parts as diverse as an old refrigerator and a bicycle chain. He has driven it, in one form or another, from the U.S. to Panama and back several times, collecting all the way.

Croat shared this and other adventures of his 30 years of plant collecting with Garden members at a curator's talk in February.

Annals Honored for Excellence

Annals of the Missouri Botanical Garden, the Garden's leading scientific journal, won the Award of Excellence for typography in a competition held by the National Composition and Prepress Association, a group of the Printing Industries of America. The entry was submitted by Allen Press, printer of the *Annals*. Out of fifteen national awards, journals produced at Allen Press won nine of them.

"We are very proud and honored to receive this award," said Amy Scheuler, managing editor of the *Annals*.

MASTER COMPOSTER

Program Supported by Monsanto Fund

In response to the statewide ban on yard waste, effective as of January, 1992, the Garden has begun a Master Composters program to teach back yard composting and yard waste management techniques to St. Louis area residents. The program has trained an initial group of 51 Master Composters, and more training sessions are planned. The volunteers will in turn teach area residents how to manage yard waste, encourage composting, and use compost and mulch to enhance their own landscapes.

The program is being supported by the Monsanto Fund and is modeled after a successful program in Seattle, Washington. Master Composters speak, give demonstrations to community groups and staff a Hotline, (314) 577-9555. Callers may ask questions during Hotline hours, 9 a.m. to noon, Monday through Friday, or else leave a message and their calls will be returned. In addition, the Kemper Center for Home Gardening has completed a video on composting, available for a $25 donation to the Master Composter Program. Three demonstration sites in the county are planned, as well.

Yard waste is second only to paper as a component of solid waste in landfills. Fortunately leaves, grass clippings and wood can find ready use in gardens, parks, or along public roads. "Composting is actually easier than bagging yard waste for pick up," said Steve Cline, manager of the Kemper Center. "It's a great way to begin the recycling habit, which will be of increasing importance as future laws become even more restrictive."

More information on the Monsanto Fund's participation in the Kemper Center for Home Gardening will be featured in a future issue of the *Bulletin*.

NEW!
Master Composter
HOTLINE
314/577-9555

9 a.m. to noon, Monday through Friday; after hours leave a message and your call will be returned.

The Garden has established the Master Composter Program to help the community respond to the prohibition of yard waste in landfills as of January 1, 1992. This community education program includes speakers, demonstrations, a video, and instruction by specially trained Master Gardeners and volunteers.

Make plans to attend the special evening lecture for Garden members on Wednesday, March 18 at 7 p.m. See page 12 for details.

Center for Plant Conservation

Falk Is Co-Editor of Conservation Guide

Donald A. Falk, director of the CPC, and Kent E. Holsinger, assistant professor of biology at the University of Connecticut, are co-editors of a resource guide for plant conservationists: *Genetics and Conservation of Rare Plants*, published by Oxford University Press. It is available in the Garden Gate Shop.

"*Genetics and Conservation of Rare Plants* is the first book length treatment of the subject of rare plant biology and conservation," said Dr. Peter H. Raven, director of the Garden, who wrote the introduction.

"The book provides a panorama of some of the most important tools that we have available for conserving plant species. It represents an important achievement for the Center for Plant Conservation as well as the Missouri Botanical Garden." The book summarizes current knowledge of the genetics and population biology of rare plants and integrates it with practical conservation recommendations. It features discussions on the distribution and significance of genetic variation, management and evaluation of rare plant germplasm and conservation strategies for genetic diversity. Case studies focusing on specific problems offer important insights for today's challenges in rare plant conservation.

The book was the result of a national conference held at the Garden in 1990 that focused on the biology and conservation of rare plants.

Comic Strips and Songs

The Center for Plant Conservation has announced support from some unusual and delightful sources. CPC is one of four organizations that will receive proceeds from the sale of items from "The Great Doonesbury Sellout," a mail-order catalogue featuring merchandise based on characters from the "Doonesbury" comic strip by Garry Trudeau. The products include clothing, accessories, toys, books and other items. The fact that the controversial cartoonist has gone commercial—although to benefit four of his favorite causes—has received attention from newspapers across the country.

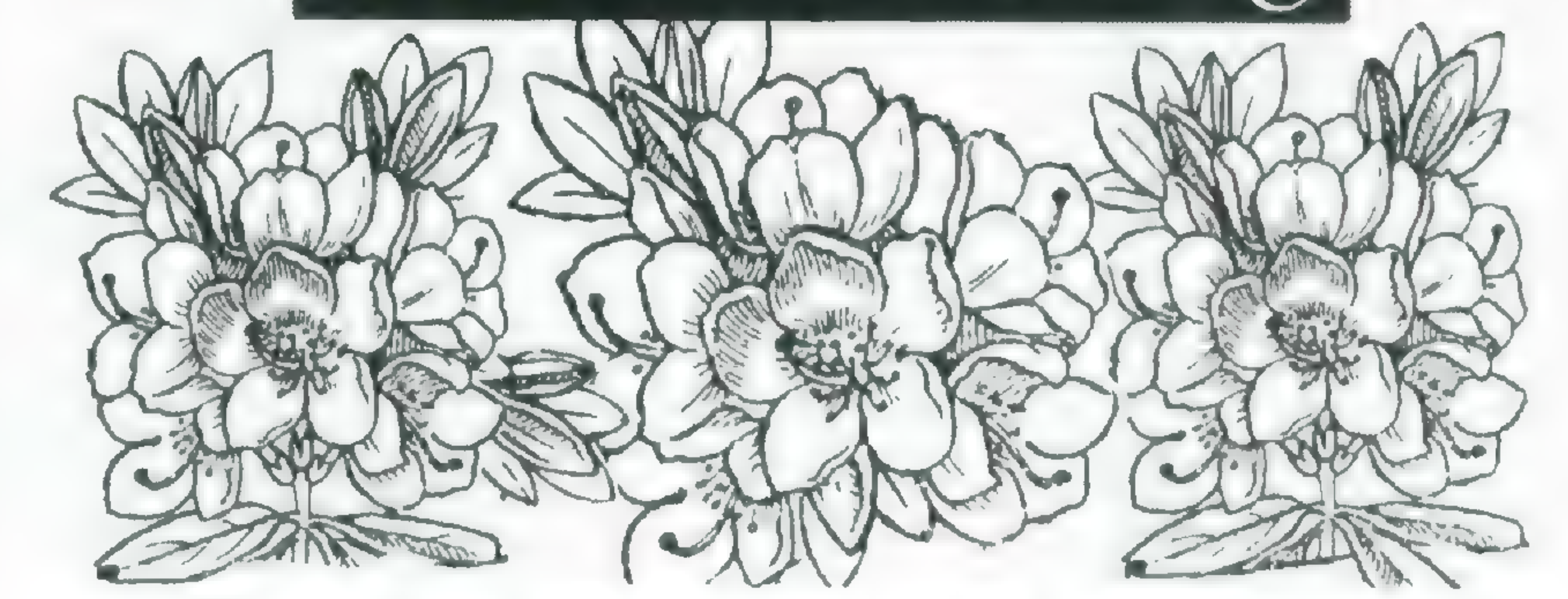
Paul Hawken, CPC trustee and founder and CEO of Smith & Hawken Inc., the mail-order catalogue for gardeners, assisted Trudeau in developing the Doonesbury material. Smith & Hawken is committed to selling only environmentally sound products in their catalogues. The company is a pioneer in supporting environmental groups. In a two page spread in its fall 1990 edition of *Bulb Book*, Smith & Hawken featured the Center for Plant Conservation and the plight of endangered plants.

CPC also will receive proceeds from the sale of "In the Garden," an instrumental recording by national artists Eric Tingstad and Nancy Rumbel, available on compact disc and audio-cassette.

The artists, who call themselves "environmental troubadours," have played at national environmental conferences, including the 75th anniversary of the International Symposium of the National Park Service and the National Audubon Society, and have performed a series of interpretive shows at Yosemite National Park. Their recordings are heard on National Public Radio.

The foreword for "In the Garden" was written jointly by Paul Hawken and Don Falk. Call the CPC at (314) 577-9450, for more information about the Doonesbury catalogue or "In the Garden."

Home Gardening



Rhododendrons and Azaleas

Azaleas and rhododendrons belong to an old group of plants in the family Ericaceae. Fossil records show that rhododendrons have been around for at least 50 million years and have changed very little. Today we recognize about 1,000 combined terrestrial and epiphytic species. These vary from tiny matlike plants to large trees growing over 60 feet tall.

Taxonomically, all azaleas and rhododendrons are classified as belonging to the genus *Rhododendron*, a point of confusion for many people. The name ''azalea'' is commonly used to distinguish deciduous plants, which lose their leaves at the end of the season and have funnel-shaped flowers with five stamens. Rhododendrons, on the other hand, are considered to be larger, evergreen, shrub-type plants with bell-shaped flowers and ten or more stamens. There are exceptions to these rules. Many garden azaleas retain their leaves all year long, depending upon where the plant is located and the climate conditions.

Growing rhododendrons is fairly easy if you choose hardy varieties and follow a few simple rules. Rhododendrons are mostly woodland and alpine plants and do best in humid, cool conditions. They require acid soils and protection from cold and wind. Azaleas tolerate more exposure to the sun and drier conditions than rhododendrons and are easier to grow for the average gardener.

LOCATION

The Missouri climate is not ideal for growing rhododendrons and azaleas because of the hot summers and potentially cold winters. Special consideration should be given to location. The plants do best in protected areas away from prevailing southwest winds and direct afternoon sun. The best site would be on the east or north side of the home where morning sun is good and the hot afternoon sun is screened out. Contrary to common wisdom, rhododendrons and azaleas do not fair well in shade; filtered sunlight is best.

A WELL-DRAINED SITE

A sloping site is ideal because good drainage is critical for these plants. Also, most soils in our landscapes are too heavy and full of clay. Root systems of azaleas and rhododendrons cannot penetrate heavy soils and are fairly sensitive to changes in temperature and soil moisture. If water in your planting bed does not drain out readily, enlarge the planting hole to twice the size of the root ball or consider a raised bed. Fill beds with well drained, amended soil.

CORRECT FOR ACIDITY

Rhododendrons and azaleas are acid-loving plants, meaning that the soil needs to be slightly acidic to optimize growing conditions. Submit at least two cups of soil from the planting site to a soil testing laboratory before planting. The Kemper Center for Home Gardening will process your samples at minimal cost and make recommendations for amendments.

Every two to three years a soil test should be repeated to check that the soil acidity remains in the desirable range of 5.0 to 5.5. After the initial preparation of the bed, additional applications of sulfur or iron sulfate may be necessary but amounts should be carefully monitored. Over-application of sulfur may lead to burning of the leaves. Apply only about one-half pound of sulfur per 100 square feet at any one time to avoid burning. Wait six weeks before applying more if required.

PREPARING THE SOIL

The planting hole should be dug out several weeks in advance of purchasing the plants. This will give some time for the soil to be prepared, amended and allow for some settling of the mixed soil. Rhododendrons and azaleas will thrive in soils heavily amended with organic matter including compost and peat moss. In heavy clay soils, spend extra time to mix plenty of organic matter with the native soil. Avoid using compost which has not broken down to a dark-colored, medium-graded material. Mixing the soil with coarse leaf mold will only mean that the soil mix and plant will settle into the hole as the leaf mold breaks down.

The soil mix should consist of about 50 percent organic matter, 25 percent native soil, and 25 percent sand or expanded clay. The latter ingredients will promote better soil drainage. When mixing, add sulfur to lower the pH according to the soil test results.

PLANTING

Rhododendrons and azaleas are typically purchased as either container or balled-and-burlapped plants. For container plants, tap the soil ball out of the container and gently tease the soil ball apart, exposing some of the roots. Do not completely disrupt the soil ball and avoid pulling the roots out. Balled-and-burlapped root balls can be planted intact. However, remove any twine used to hold the ball together and tied to the main stem.

There are two different methods of planting: in-ground and raised beds. But before you begin to dig the hole, plan to space the plants about three to four feet apart. This will allow room for growth over time and some space to get in and around the plants for maintenance.

IN-GROUND

The diameter of the planting hole should be dug to about one foot larger than the diameter of the soil ball. The wider the hole, the better chances of success. This is because these plants are shallow rooted and develop a root system that grows laterally instead of deep. The depth of the planting hole should be no deeper than necessary to position the plant so that the soil ball is about two inches higher than the surrounding soil to allow for settling. The only time you may need to dig the hole deeper is if there is poor sub-surface drainage, especially on a flat site where water can collect. Loosening the soil in the bottom of the hole should correct this.

RAISED BEDS

Because planting in heavy clay soil can be a real problem for growing rhododendrons and azaleas and considerable effort will go into improving these soils, planting on top of the soil surface in a raised bed is a good alternative method. To make a raised bed, simply position the root ball on top of the native soil surface and fill in around the plants with a soil mix as described above. Over time, the soil will settle so additional materials should be applied keeping close watch that the root system does not become exposed.

Until the plants have formed a good root system extending into the amended soil, they will be unstable and might shift. In areas where wind or foot traffic is a problem, plan to stake the plants. Do not put a raised bed in a low area where water collects.

MULCHING

Keeping the root ball high in the planting site means that plenty of mulch should be used to cover the root system above the soil surface, especially following planting. To do this, mulch around the plant with about four to six inches of leaf mold. Oak, maple leaves and pine needles are acidic materials which will help keep the soil acid if used before they are completely decomposed. Otherwise, just use half composted leaf mold and half wood chips of any source. Maintain this mulch throughout the year to protect the crown against freezing and thawing.

WATERING

Overwatering is the leading cause of difficulties for rhododendrons and azaleas. Since they are shallow-rooted, they require a steady supply of water. Follow a regular watering schedule of one inch per week through the summer. For well-drained beds, this should be sufficient.

Frequently, gardeners complain of leaves dropping and wilting in spite of apparently adequate water supply. In poorly drained sites, when the root system becomes waterlogged, leaves will fold up and droop downward as if they are dry. This promotes the temptation to begin watering, which further aggravates the problem. Root systems sitting in water become devoid of oxygen and fail to take water up, leading to a water deficit. If this condition prevails, it can lead to root rot and overall decline. The remedy is to start with a well drained site and if these symptoms occur, dig down into the soil to check whether excess water has collected as evidenced by the heavy smells of decaying organic matter.

For rhododendrons and evergreen azaleas, it is best to begin withholding water about early-October so that plants will start to harden off in preparation for winter and colder temperatures. If the fall has been excessively dry, it is helpful to water after the first killing frost to make sure that some water is available for plant uptake. On cold, sunny, windy winter days, the root system will need to replace water evaporating from the evergreen leaves to prevent scorch. Fall watering can begin about mid-November.

FERTILIZATION

Rhododendrons and azaleas do not require much fertilizer. Over-fertilization can be a problem, especially if done at the wrong times. Water-soluble fertilizer should be applied in May after flowering. Slow-release fertilizers, including organic forms, can be applied earlier. Plants should not be fertilized after June.

PRUNING

Generally, rhododendrons and azaleas do not need much pruning except to correct form, maintain good flowering from season to season and remove diseased portions. Prune only after flowering has ceased. Deadhead spent blossoms and flower stems with a clean hand pruner. Do not remove more than necessary, or you will affect next year's flowers.

WINTERIZATION

The most common symptom of cold exposure in evergreen varieties is rolled up leaves that droop downward. This is quite normal and should be expected during winter. However, sun and wind will cause water loss from the leaves and stems. The only way to prevent this from having a real impact upon the plant is to protect it with barricades of evergreen branches, burlap screens, snow fence or other materials.

OTHER INFORMATION

Overall, rhododendrons and azaleas have few pest and disease problems. Consult the Kemper Center's guide on Rhododendrons and Azaleas for more information on desirable varieties and on all of the topics in this article.

—Steven Cline, Ph.D.,
Manager of the Kemper Center for Home Gardening

Timely Tips from the Answer Service

Do you have a plant question? Call the Horticultural Answer Service, Monday through Friday, 9 a.m. to noon, at **577-5143.**

March Tips

■ Delay planting if the garden soil is too wet. When a ball of soil crumbles easily after being squeezed together in your hand, it is dry enough to be safely worked.

■ Fertilize the vegetable garden as the soil is being prepared for planting. Unless directed otherwise by a soil test, one to two pounds of 12-12-12 or its equivalent per 100 square feet is usually sufficient.

■ To control iris borers, clean up and destroy the old foliage in your iris beds before new growth begins.

■ Heavy pruning of trees should be completed before growth occurs. Trees should not be pruned while the new leaves are growing.

■ Fertilize bulbs with a "bulb booster" formulation broadcast over the planting beds. Hose off any granules that stick to the foliage.

■ Dormant mail order plants should be unwrapped immediately. Keep the roots from drying out, store in a cool protected spot, and plant as soon as conditions allow.

■ Trees, shrubs and perennials may be planted as soon as they become available at local nurseries.

■ Summer and fall blooming perennials should be divided in spring. Apply a balanced fertilizer such as 6-12-12 to perennial beds when new growth appears.

■ Two handsome houseplants that provide fragrant blossoms indoors this month are the Confederate jasmine *(Trachelospermum jasminoides)* and Japanese pittosporum *(Pittosporum tobira)*. Both thrive in average home conditions and are easy plants to grow.

April Tips

■ Plastic films can be used to pre-heat the soil where warm season vegetables are to be grown.

■ April 15 to April 20 are the dates of the average last frost for the St. Louis area.

■ Winter mulches should be removed from roses. Complete pruning promptly. Remove only dead wood from climbers at this time. Cultivate lightly, working in some compost or other organic matter.

■ Groundcovers can be mowed to remove winterburn and tidy plants up. Raise mowers to their highest settings. Fertilize and water to encourage rapid regrowth.

■ Examine shrubs for winter injury. Prune all dead and weakened wood.

■ When crabapples are in bloom, hardy annuals may be transplanted outdoors.

■ Enjoy but do not disturb the many wildflowers blooming in woodlands throughout Missouri.

■ When buying bedding plants, choose compact, bushy plants that have not begun to flower.

■ Break off rims from peat pots when transplanting seedlings, otherwise they act as a wick to draw moisture away from the roots.

■ Mount a rain gauge on a post near the garden to keep track of precipitation so you can tell when to water. Most gardens need about one inch of rain per week between April and September.

■ Apply crabgrass preventers before April 15. Do not apply to areas that will be seeded.

—Chip Tynan, The Answer Service

March 1 - April 5 "Tropical Rainforests: A Disappearing Treasure"

A traveling exhibit by the Smithsonian Institution is on display at the St. Louis Science Center, sponsored jointly by the Garden, the Science Center and the Saint Louis Zoo, co-sponsored by KMOV-TV Channel 4. Call the Hotline for special activities and programs at all three institutions: (314) 995-2000.

MEMBERS' EVENTS

March 11 Members' Day Film Series: "The Living Planet"

7 p.m., Shoenberg Auditorium. Learn about environmental issues with "The Jungle" and "Our Threatened Heritage." Dr. James Solomon, head of the MBG herbarium, will answer questions. Free, limited seating. For members only.

March 18 Members' Gardening Lecture: "Backyard Composting"

7 p.m., Shoenberg Auditorium. A demonstration lecture by Dr. Steve Cline, manager of the Kemper Center for Home Gardening. Learn how to deal with yard waste so you can comply with the new state law eliminating yard waste disposal in landfills. Free, for members only. Limited seating.

April 4 Members' Day Jonquils and Dogwoods Walk

10 a.m. to 3 p.m., Shaw Arboretum. Bring a picnic lunch and enjoy a family outing surrounded by the early-blooming stars of spring. Receive a free tree seedling in honor of Arbor Day. Free, for members only.

Missouri Botanical Garden

CALENDAR OF EVENTS

March-April 1992

Five Tuesdays in March "Gardening by Design" Lecture Series

A popular lecture series by experts in landscape design and horticulture. Tickets are available by subscription for the afternoon series at 1 p.m. or the evening series at 7 p.m. $20 members, $24 nonmembers. Afternoon and evening tickets cannot be mixed in a subscription. Single tickets are $5 to members, $6 to non-members, and are available at the door only if the series is not sold out. Call 577-5125 for information.

MARCH 7 - APRIL 5 / Spring Flower Show

9 a.m. to 5 p.m. daily, Orthwein Floral Hall. Free with Garden admission. *See March 6 for members' preview.*

MARCH

3 TUESDAY

Amazon Jungle Expedition Preview

7 p.m., Shoenberg Auditorium. Video and slide presentation. Preview next July's trip to the rain forests of Peru with MBG education staff. See page 16. Free, limited seating.

Gardening by Design Lecture: "Environmental Gardening"

1 and 7 p.m., Shoenberg Auditorium. Laurence Sombke discusses home gardening techniques that don't harm the environment. *See highlight.*

6 FRIDAY

Members' Preview of Spring Flower Show

5 to 8 p.m., Ridgway Center. Catch the first glimpse of springtime! Entertainment, fashions by Episode of the Galleria, cash bar. The Garden Gate Shop will be open. Dinner buffet in the Gardenview Restaurant. For members only.

8 SUNDAY

2nd Annual Child's Global Village

Noon to 5 p.m., Ridgway Center. What do people in Brazil eat? What does an African Pygmy bow
arrow look like? Come disco
diverse cultures of the world
educational fair co-sponsore
Garden and the Greater St.
Returned Peace Corps Volu
Call 577-5148 or 577-5149 fo
information. Free with Gard
admission.

10 TUESDAY

Gardening by Design Lect
"The Evening Garden"

1 and 7 p.m., Shoenberg Au
rium. Cathy Wilkinson Bara
shows you ways to enjoy yo
garden after the sun goes d
See highlight.

12-14 THURS SATUR

All-City Middle School Science Fair

9 a.m. to 5 p.m., Ridgway C
Students from St. Louis city
schools, grades 6 to 8, will d
science projects with the ob
of promoting self-esteem an
dence in scientific research.
Cosponsored by the Garden
St. Louis Public Schools, an
Regional Science and Techn
Career Access Center (RCA
(314) 577-5140 for more info
mation. Free with Garden ad

17 TUESDAY

Gardening by Design Lectu
"Innovative Uses of Peren

1 and 7 p.m., Shoenberg Au
rium. Cole Burrell demonstr
up-to-date suggestions for lu
combinations of flowers and
See highlight.

24 TUESDAY

Gardening by Design Lectu
"Strategies in Urban Gardening"

1 and 7 p.m., Shoenberg Aud
rium. Gardening columnist P
Hagan is a selftaught "Green
Guerrilla" in New York City.
offers strategies for coping w
difficulties of city gardening.
See highlight.

CH continued

WEDNESDAY

e Eating"

., Kemper Center. A cooking stration by the American Association features delicious o eat for good health. Free arden admission.

FRIDAY

Friday: Spotlight on Rain t Research

n. to 2 p.m., Climatron and ings Interpretive Center. See

botanists at work, collecting, preparing and preserving plant specimens for scientific study. Free with Garden admission.

28 SATURDAY

Treasures of the Climatron: "Living Rain Forests of Asia"

10 a.m. to 5 p.m., Climatron and Ridgway Center. Discover the beauty and diversity of people, plants and animals of the Asian rain forests. Films, lectures, a puppet show, "Grocery Story Botany," terrarium workshop, and special activities. Free with Garden admission.

31 TUESDAY

Gardening by Design Lecture: "Garden Design with Foliage"

1 and 7 p.m., Shoenberg Auditorium. Judy Glattstein shows you how to extend the beauty of your garden after blooming season with colorful foliage and textures. *See highlight.*

Kemper Center for Home Gardening

Open 10 a.m. to 4 p.m. daily. Plant Doctor available 10 a.m. to noon and 1 to 3 p.m. Monday through Saturday. Free with regular Garden admission.

Tower Grove House Tea Room

Open for luncheon Monday through Friday, 11:30 a.m. to 1 p.m., February through November, plus special Holiday Luncheons in December; advance reservations only. Call 577-5150.

Garden Walkers' Breakfast

7 to 10:30 a.m., every Wednesday and Saturday. Restaurant and grounds open early; free admission until noon. Sponsored by the American Heart Association. Call 577-5125 for information.

APRIL

WEDNESDAY

lant Hunters: A Portrait of uri Botanical Garden

to 5 p.m. daily through April dgway Center. Exhibit of photos hs by James P. Blair, taken for *al Geographic* magazine. ith Garden admission.

3 FRIDAY

Arbor Day Celebration

9 a.m., Ridgway Center. In honor of Arbor Day, the first 500 Garden visitors will receive a free tree seedling, with care instructions, courtesy of the Missouri Department of Conservation.

CIAL EVENT AT SHAW ARBORETUM

THURSDAY

scape Photography Lecture

) p.m., Shoenberg Audito- John Smithers, award-winning naker and authority on wild- r and landscape photography, sses his work. $18 members, on-members. Limited seating; ce registration is requested. haw Arboretum at 1-742-3512.

25-26 SATURDAY-SUNDAY

Landscape Photography Workshop

Two sessions daily: 6:30 to 10:30 a.m. at Shaw Arboretum; and 5 to 7:30 p.m. at the Garden. Join John Smithers for a comprehensive workshop in wildflower and landscape photography. $175 members, $200 non-members, includes lecture on April 23. Reservation are limited, advance registration required. Call the Arboretum at 1-742-3512 for more information.

23-26 THURSDAY SUNDAY

Garden Gate Shop Sale

9 a.m. to 6:30 p.m., Thursday and Friday; 9 a.m. to 5 p.m., Saturday and Sunday. Garden Gate Shop and Orthwein Floral Hall. Members receive 20% discount, all four days. *See page 20.*

29 WEDNESDSAY

"I Love Eating"

11 am., Kemper Center. See March 25 for details.

COMING IN MAY

APRIL 30, MAY 1-2
13th Annual Storytelling Festival: "Sparks by the River: Dreams and Destiny"

The Garden will host storytelling sessions open to area schools and the public sponsored in conjunction with the University of Missouri-St. Louis. Thursday, April 30, and Friday, May 1, festival is open to schools by reservation only; Saturday, May 2, festival opens to the public at 2 p.m. Featuring some of the country's best known storytellers and popular regional performers. Call for reservations beginning March 6: 8:30 a.m. to 1:30 p.m., call 553-6161; after 1:30 p.m. call 553-5948. Free with Garden admission.

WALKING TOURS
Every Tuesday, Saturday and Sunday 1:00 p.m.

Join the Garden Guides for a tour of the grounds, featuring the art, architecture, history and horticulture of the Garden. Meet at the ticket counter in the Ridgway Center. Free with regular Garden admission.

New Officers and Board Members Elected

The Garden Members' Board appointed new members at the annual meeting January 13, 1992. Shown left to right: Marcia Trulaske, Donna Walker, Joe Curtis, Minnie Perry and Jean Richardson. Not pictured: Herbert Jones, Mary Langenberg, and Anne Tao.

Also elected at the meeting were 1992 Garden Members' Board officers. Shown left to right: Susie Schulte, first vice president; Mary Longrais, president; Leslie Dimit, secretary; and Patty Arnold, second vice president. Not pictured: Bill Gilbert, treasurer.

Garden Clubs Support MBG

Florence Forbes, a member of the Garden Members' Board who serves as our representative to the state Federated Garden Clubs, initiated a program last year to encourage the clubs' financial support for the Garden. State garden clubs contributed over $13,700 to various Garden fundraising efforts in 1991. We express our sincere gratitude to Florence and to all of the garden clubs who so generously responded to her appeal.

A Special Thank You!

We gratefully acknowledge GE Lighting and Mr. Gary Faust, regional manager, for their generous donation of tree lights for the 1991 Holiday Members' Tree last December. We also would like to thank Holbrook Travel of Gainesville, Florida, for donating a trip to Costa Rica as an attendance prize for the party, ''An Enchanted Rain Forest,'' in January.

Sue Rapp Is Honored

Sue Rapp, outgoing Board president, was honored at the January 13 annual Members' Board meeting for two outstanding and enthusiastic years of leadership. She was honored again by the Trustees on January 15, and is shown above with O. Sage Wightman III, president of the Board of Trustees.

Flower Festival Is April 25 and 26

In his Will, Henry Shaw, founder of the Missouri Botanical Garden, made a special bequest to the Bishop of the Missouri Diocese for a sermon by a minister of his choice to be delivered each year in Christ Church Cathedral ''on the wisdom and goodness of God as shown in the growth of flowers, fruits, and other products of the vegetable kingdom.'' Known affectionately as the ''Flower Sermon,'' the talk has been delivered every year since 1889, except 1950 and 1951. The Garden has provided flowers to decorate the Cathedral since 1937, and today it donates over 1,000 plants.

''Flower Sunday,'' as the annual event came to be known, turned into a Flower Festival weekend in 1974. The festival generates funds used to benefit many worthy causes. In 1991 the proceeds went to The Hunger Fund, administered by the Task Force on Hunger and Homelessness of the Episcopal Diocese of Missouri.

This year the Flower Festival will be held the weekend of April 25 and 26. On Saturday, there will be a service at 11 a.m.,followed by a street fair 12:15 to 3 p.m. and concerts in the Cathedral at 1 and 2 p.m. On Sunday the Flower Sermon will be preached at services at 9 and 11 a.m. Call 231-3454 for more information.

1992 MEMBERS' TRAVEL PROGRAM

Lewis and Clark Trail

JUNE 12 to 25, 1992

Call now to reserve your place on this popular tour retracing the rugged route of the Lewis and Clark expedition. Join hosts Dr. Ray Breun of the Riverlands Association and botanist Alan Brant of the Missouri Botanical Garden on this fascinating motorcoach tour.

Trip Preview Lecture: Tuesday, May 5, 7:30 p.m., Shoenberg Auditorium.

Santa Fe Trail

JULY 20 TO 29, 1992

Join hosts Dr. Ray Breun of the Riverlands Association and Dr. Marshall Crosby, assistant director of the Garden, as they guide you in an intriguing exploration of the American West, rich in history, lore and legend! Retrace the steps of the pioneers and expand your knowledge of natural history on this motorcoach tour.

Trip Preview Lecture: Thursday, May 7, 7:30 p.m., Shoenberg Auditorium.

For a complete itinerary and information on these trips, call the Membership Office at (314) 577-9500.

Directors of the Garden, Science Center and Zoo enjoy the party: from left, Peter Raven, Dennis Wint and Charles Hoessle.

An Enchanted Rain Forest

On January 10, 1992, over 1,000 members of the Garden, St. Louis Science Center and Saint Louis Zoo attended a delightful preview party at the Science Center featuring the Smithsonian exhibit "Tropical Rainforests: A Disappearing Treasure." The event was planned and co-sponsored by all three institutions. Proceeds from the event will be used to encourage the public to visit this exciting exhibit on display at the Science Center through April 5, 1992.

In addition, programs of educational and entertaining activities related to the display will be presented at the Garden, Science Center and the Zoo throughout the exhibition. Call the special Hotline for a schedule of events: (314) 995-2000.

THIS SPRING AT SHAW ARBORETUM

Spring Wildflower Walks

Seven Tuesdays:
April 7, 14, 21, 28 and May 5, 12, 19
9:30 a.m. to 1:30 p.m.

Study and enjoy the awakening of the wildflowers of the Ozarks. The Arboretum's excellent trail system winding through upland and bottomland forest is the ideal place. These informal Tuesday walks are led by expert wildflower naturalists. Wear comfortable hiking clothes and bring a sack lunch. Meet at the Shaw Arboretum Visitor Center. No reservations necessary. $1 members, $2 non-members.

The Loop Road and the Wilderness Wagon

From April 1 through November 4 the Trail House Loop Road will be open to vehicles from 8 a.m. to 4 p.m. on Wednesdays and Thursdays. For safety reasons, visitors are asked to stop and register at the Visitor Center.

The Arboretum will also offer narrated tours on the popular Wilderness Wagon, an open-sided vehicle that can accommodate 28 people. The Wagon will run on Sunday from April 12 through June 21 and September 13 through October 25. Depending on the season, visitors may see thousands of daffodils, delicate wildflowers, the tall grass prairie, fall foliage, many species of birds and, with luck, deer or wild turkey. The Wagon leaves the Visitor Center on an hourly schedule and stops at the Trail House. Visitors may spend time walking the woodland trails and return to the Visitor Center on a later trip.

The Wilderness Wagon may also be reserved for tours, Monday through Friday. A naturalist will accompany you on the three mile drive around the Trail House Loop and, if you wish, will lead your group on a short walk along one of the trails where you may see hundreds of flowers in bloom. For more information, please call the Arboretum at 1-742-3512 or 1-742-0850. Both calls are toll free from St. Louis.

Wildflower and Landscape Photography Lecture and Workshop

Lecture:
Thursday, April 23, 1992
7 p.m. to 10 p.m.
Shoenberg Auditorium, Ridgway Center

John Smithers, award-winning film maker and authority on wildflower and landscape photography, shows slides and discusses his work. Advance registration is required and seating is limited. $18 members, $20 non-members.

Workshop:
Saturday & Sunday, April 25-26, 1992
2 sessions each day:
6:30 to 10:30 a.m. at Shaw Arboretum
5 to 7:30 p.m. at Missouri Botanical Garden

Join John Smithers for a comprehensive workshop on wildflower and landscape photography. Reservations are required and limited. $175 members, $200 non-members (fee includes Thursday night lecture). Call Shaw Arboretum for information and reservations at 1-742-3512 or 1-742-0850 (toll free from St. Louis).

The St. Louis Flower Show

The St. Louis Flower Show, sponsored by the Junior League of St. Louis, will be held this year on April 23-26, 1992, at Queeny County Park. The Garden will be one of the participants, with an exhibit on home gardening to be staffed at certain hours by experts who can answer gardening questions. The theme of the show this year is "English Gardening," inspired by London's famous Chelsea Flower Show. Proceeds from the event support projects sponsored by the Junior League. Call 997-3407 for program information.

Expedition to Amazon Jungle

It is to be an educational travel experience unlike any other. When the Missouri Botanical Garden embarks on its second expedition to the remote Amazon rain forests of Peru, July 18-25, 1992, participants will learn the vital role the Amazon region plays in global ecology. Join us for a free video and slide show preview Tuesday, March 3, 7 to 9 p.m., in the Shoenberg Auditorium, Ridgway Center.

The Amazon Basin is a place of unequalled species diversity. The group will observe some of the 3,000 species of birds, 4,000 species of butterflies, and 2,000 species of fish, more than man has recorded in the entire Atlantic Ocean.

The fascinating river and jungle adventure will explore the rich Peruvian section of the Amazon river and surrounding river basin. Travelers will stay in secluded river lodges in the dense tropical rain forest.

The trip, to be led by Garden education division staff, is designed to stimulate and educate participants about the natural wonders of the Earth, particularly the plants, wildlife, and inhabitants of the Amazon.

Local guides with an extraordinary knowledge of the plants and animals indigenous to the Amazon will accompany the Missouri Botanical Garden group along rain forest trails and boat journeys on the Amazon River and its tributaries. Expedition participants will also have opportunities to interact with natives of the Amazon. These cultural exchanges go far towards supporting conservation by kindling among local inhabitants a pride in safeguarding the plants and animals that are their natural heritage.

The group will also venture up into the rain forest canopy on a newly constructed canopy walk to observe the remarkable plants and animals which inhabit this area. The Garden was instrumental in the construction of the walk.

Anyone interested in joining the Garden on this expedition of discovery to the Amazon should contact Glenn Kopp or Barbara Addelson, Missouri Botanical Garden Education Division, (314) 577-5140.

NEWS FROM THE HENRY SHAW ACADEMY

Spring Academy Classes

The Henry Shaw Academy at the Missouri Botanical Garden offers students ages 4 to 18 exciting ways to investigate the world around them. This unusual program is for students who are interested in exploring the world of science, ecology and natural history. As Academy students, participants can select from a variety of courses throughout the year as well as a Summer Science Camp. These "hands-on" experiences offer students opportunities to deepen their understanding and appreciation of their natural world.

Ecological discovery and science oriented classes this spring will include:

Pitzman Nature Study Classes for ages 4 to 6:
April 18 and 25, May 16 and 23
Session A: 10:30 a.m. to 12 noon
Session B: 1:30 p.m. to 3 p.m.

Classes for ages 7 to 9:
Trees for Life
April 4, 9 a.m. to 12 noon
Bonsai for Breakfast
April 18, 9 a.m. to 12 noon
Field Class at the Arboretum
April 11, 10a.m. to 2 p.m.
Family Class at MBG
April 25, 9 a.m. to 12 noon

Field Classes for ages 9 to 12:
Spring Canoeing and Caving
May 2, 9 a.m. to 6 p.m.

Tuesday/Thursday Afterschool Topics at The College School and MBG for ages 9 to 12:
Creations from the Earth
April 9, 16, 21, 3:30 to 5 p.m.

Field Classes for ages 10 to 12:
Special Program: Micro-Worlds
May 9, 16, 9 a.m. to 12 noon
Family Class at the Arboretum
May 30, 3 p.m. to 7 p.m.

For more information on Henry Shaw Academy, Spring and Summer science/natural history classes call 577-5135 or 577-5140 for a course brochure or registration information.

Tropical Rain Forest Summer Workshop for Teachers

Once again the Garden is offering a summer workshop on the nature and value of tropical rain forests, the social and economic factors contributing to their destruction and the methods for their preservation. The course will be held at the Garden, June 15-26 in ten sessions from 9 a.m. to noon.

The course is designed to prepare teachers of grades K-12 to teach about deforestation in their classrooms and will provide them with materials, strategies and resources. Two graduate or undergraduate credit hours in biology or education from the University of Missouri-St. Louis will be awarded upon completion. Instructors will be Garden staff and area specialists.

For more information call 577-5140.

Elderhostel Programs at the Garden

Elderhostel provides adventures in learning and travel for adults over 60. Cultural centers, colleges, universities and conference centers throughout the world host weeklong non-credit programs. Each week includes field trips and classes centered on three courses of study. Participants share all levels of formal education and possess an inquiring mind. Instructors are enthusiastic, knowledgeable communicators.

This year the Missouri State Elderhostel will offer programs at Camp Wyman, an environmental education center in Jefferson County offering pleasant retreat-style accommodations. The programs will feature some classes taught at the Garden by Garden staff, including a course in March on "Seiwa-en: Symbolism and Philosophy in Japanese Gardens." Companion courses offered by Camp Wyman will treat environmental meteorology and nature and travel photography. Courses to be offered at the Garden in September will include "Historic Missouri Landscapes" and "Endangerment in the Tropics and Our Own Backyard."

Tuition for Elderhostel programs is very reasonably priced and includes field trips, classes, lodging and meals. Commuters may enroll for slightly lower fees. Call (314) 553-5911 for more information.

Mellon Foundation Supports Research

The Andrew W. Mellon Foundation has awarded the Garden two grants to support various projects of the research program. The first award, $750,000 for three years, will support the ongoing development of the computer system and botanical database, TROPICOS; initiation of a checklist project for the flora of Ecuador; and continuing field work in Peru.

Computerization has become an essential tool of modern botanical research worldwide. The Garden's department of Botanical Information Management (BIM), under the supervision of Dr. Nancy Morin, is working to make data and programs available through national and international networks. The database system, TROPICOS, is being redesigned to take advantage of up-to-the-minute technology. BIM is working to integrate computers at the Garden, linking the library catalog, research databases, the Garden's living plant inventory, and the Center for Plant Conservation. The Garden also will be able to increase its collaborative efforts with other institutions, working together to design computer systems that will be useful to all. In addition, BIM will begin to add Geographical Information System technology and imaging to its capabilities, allowing sophisticated analysis of plant distributions, a powerful tool for researchers and conservationists.

Under a previous grant from the Mellon Foundation, the Garden has been active in Peru since 1989. Under the coordination of Dr. Alwyn Gentry and Dr. John Pipoly, six Peruvian botanists gathered over 100,000 plant specimens. Aided by technicians in St. Louis, a checklist of Peruvian plants is well underway. The current grant, under the supervision of John Pipoly, will allow the work to continue, concentrating on areas of special importance.

The checklist of Peru serves as a model for a checklist of the flowering plants of Ecuador, to be prepared under the supervision of BIM in collaboration with the University of Aarhus, Denmark, and institutions in Ecuador. The Garden has been active in Ecuador for several years; the flora is even richer than Peru, and not so well documented. There is considerable overlap in the plants of the two countries, and data from the Peru checklist will contribute significantly to the Ecuador project.

Graduate Program Expanded

A grant of $600,000 from The Andrew W. Mellon Foundation will permit the expansion of the graduate program at the Garden. The Garden currently trains fifteen Ph.D. students in systematic botany in conjunction with Washington University, St. Louis University, University of Missouri-St. Louis, and Southern Illinois University, Edwardsville. The new grant will provide funding for six additional students for the six-year program with Washington University.

''The Garden has been training botanists for more than one hundred years,'' said Dr. Mick Richardson, head of the graduate study department. ''As natural habitats around the world are destroyed at an ever increasing rate, the need for botanists becomes ever more urgent. Besides the loss of potential food and medicinal plants, the extinction of species before we can catalogue and study them makes it increasingly difficult to understand the evolution of life on earth.''

Today fewer and fewer universities maintain the herbarium and taxonomic library essential for training taxonomists. Students in the Garden's program benefit from a well rounded program of both theoretical and practical training in all aspects of plant systematics, including herbarium work, molecular studies, cladistics, and morphology, plus cytology, nomenclature, library studies, scientific publication, and field studies. The faculty at Washington University, together with Garden researchers, many of whom serve as adjunct professors at the University, provide unsurpassed supervision.

The first students under the grant will begin their studies in July, with an annual stipend of $13,600, plus tuition.

''We are very honored to receive this magnificent support from the Mellon Foundation,'' said Dr. Peter H. Raven, director. ''The grants mean we can continue and expand our research programs at a time when they are urgently needed, and we are deeply grateful.''

Dr. Peter H. Raven is greeted by His Holiness John Paul II, who granted an audience to participants in the St. Francis Prize and endorsed their goals of ethical use of global environmental resources.

Raven Participates In International St. Francis Prize

The second annual International St. Francis Prize for the Environment was presented October 26, 1991, at the Basilica of St. Francis in Assisi, Italy. Dr. Peter H. Raven served on the panel of 12 jurors making the awards, which are promoted by the Franciscan Center of Environmental Studies and the Sacred Convent of St. Francis in Assisi, and sponsored by the government of Italy. A 1987 papal proclamation named St. Francis the patron saint of ecologists.

The ''Canticle of All Creatures'' prize is awarded to persons or institutions that have distinguished themselves at the highest international level to the harmonious relations of human beings within their environment. The 1991 awards were presented to Professor Salvatore Furia, Dr. Thomas Francis Malone, and the Republic of Costa Rica.

The awards ceremony was part of an international seminar held in Assisi October 23-25. Participants discussed ethical and moral concerns relating to environmental issues.

Horticulture in Missouri

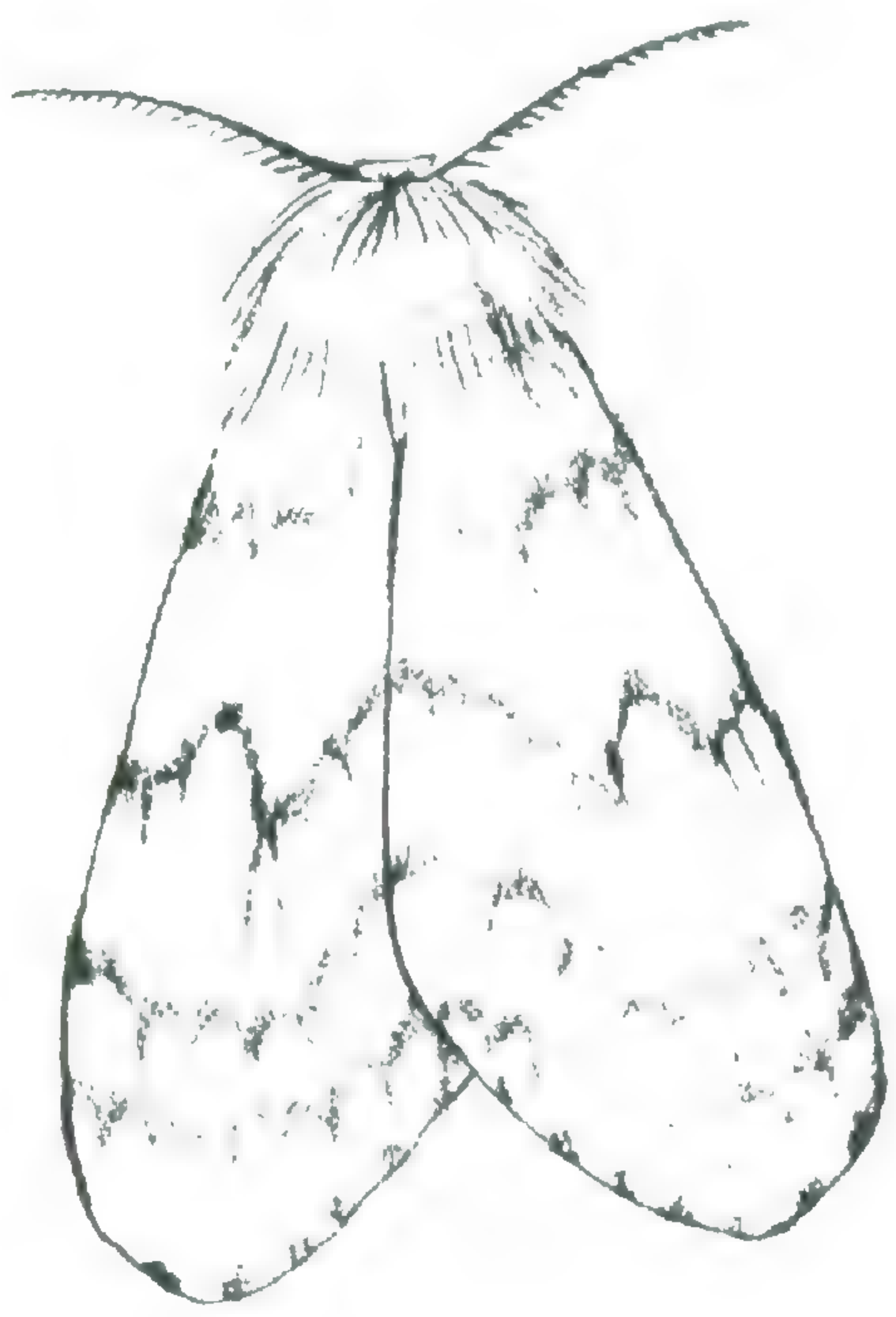
Gypsy Moths: Biological Pollution

Don't pick up hitchhikers! The sage advice of your mother is particularly true when it comes to gypsy moths. This little moth was brought to the United States from France in the 1860s for use in silkworm breeding projects. Some moths escaped near Boston in 1869, began feasting on the leaves of trees, and soon their offspring were hitching rides farther and farther from Boston. The fact that they have established populations in more than fourteen states and Canada is particularly interesting, especially since the gypsy moth is unable to travel far on its own. Although the caterpillars can move for short distances, adult female moths have wings but cannot fly. Truly, gypsy moths have hitchhiked, in that their eggs have been inadvertently carried by humans. Unfortunately, a few have arrived in Missouri.

The gypsy moth provides an interesting natural history story about the ability of a species to colonize an area. However, this insect is also an example of **biological pollution**, and illustrates the immense damage that an introduced species can cause on a landscape. In their native habitat, population growth of the gypsy moth is curtailed by naturally occurring predators, parasites, and diseases. Introduced onto this continent and lacking checks on population growth, large numbers of gypsy moths can completely defoliate trees and are now a major pest of hardwood forests; over 13 million acres of forested land was defoliated in the United States in 1981 alone. It is estimated that federal and state agencies spent over $20 million in 1990 in attempts to suppress gypsy moth outbreaks.

By understanding the several stages in the life cycle of the gypsy moth, we can take steps to prevent their further spread. Through winter and into spring, the moths exist as eggs in a hairy, brown or tan egg mass that is one to one and a half inches long and can contain up to 1,000 eggs. When trees leaf out in the spring, the eggs hatch into their larval, or caterpillar, stage. The caterpillar climbs the nearest tree and eats . . . and eats . . . and eats. The hairy, 1½ to 2½ inch long caterpillar is easily identified by the eleven pairs of spots running along its back; the five pairs of spots nearest its head are blue, while the rear six pairs are brick red. Use a stick when examining caterpillars since many, including that of the gypsy moth, can sting. By mid-June or July, the caterpillars pupate, and then the adult moth emerges. Mating and egg-laying occur in July and August, and the cycle begins again.

Attempts to control the gypsy moth by spraying pesticides or viral agents have met with limited success, and can have damaging environmental side effects; our native insects are often killed, as well. Gypsy moths have also developed resistance to many of these agents. Some of the brightest news for the control of the gypsy moth may be a fungus that is destroying entire populations of the caterpillars. The fungus was introduced in 1911 as a measure to control the insects, but it has only recently begun to affect the populations.



In Missouri, there are approximately 20,000 square miles of forested land that could be damaged if an infestation occurs. Oak trees are a particular favorite of the caterpillars, but most of our tree species, including conifers, are susceptible. Although gypsy moths are not currently a problem here, several have been trapped in the St. Louis area. The moths probably arrived here via truck and camper axles and on nursery trees shipped from the Northeast.

In the meantime, all of us can do a few things to help prevent an infestation in this area. First of all, learn to identify the various stages in the life cycle of the gypsy moth. Secondly, inspect the underside of your car or camper when you are traveling, so that you are not spreading the gypsy moth. Also, look for the egg masses when you are in your yard or taking a walk this spring. Look on tree bark or in fissures in the bark, under lawn furniture, in your woodpile or on a stone fence. If you find the brown, hairy gypsy moth egg masses, pry them off and drop the entire mass into a jar of rubbing alcohol or fingernail polish remover. If you have an oak tree in your yard, tie a loose burlap skirt around the tree about five feet above ground; gypsy moth caterpillars will crawl up the tree and rest under the burlap. Check your trap in the late afternoon, and carefully remove any that have accumulated. By the way, birds may beat you to the caterpillars!

You can learn more about the gypsy moth, how to prevent its spread, and how to protect your trees by asking for pamphlets and talking to the staff at the Kemper Center for Home Gardening this spring and summer. Also, the United States Department of Agriculture has published several informative booklets. Write to the U.S. Government Printing Office, Washington, D.C. 20402 and ask for the free booklet, *The Gypsy Moth Handbook*, Home and Garden Bulletin No. 227.

—Lucile M. McCook,
Horticultural Taxonomist

Research Division Is Reorganized

Dr. W. Douglas Stevens, director of research, has announced the creation of three new departments in the research division at the Garden.

The new departments are Neotropical Floristics, headed by Dr. Bob Magill; Neotropical Taxonomy, headed by Dr. Henk van der Werff; and Africa and Madagascar, headed by Dr. Porter P. Lowry II. Neotropical Floristics will encompass all the Garden's flora projects in Central and South America. A flora is the study of all the plants within a specific region. Neotropical Taxonomy will include researchers describing and naming specific groups of plants, regardless of where they occur. The program in Africa and Madagascar will perform all of these functions for the African Tropics and Subtropics and will work to extend the scope of the Garden's exploration and collaboration in this part of the world.

The other departments in the division are Botanical Information Management, headed by Dr. Nancy Morin; Graduate Studies, headed by Dr. Mick Richardson; the Herbarium, headed by Dr. James C. Solomon; and Scientific Publications, Amy Scheuler, managing editor.

Trustees Hold Annual Meeting

The Board of Trustees held its annual meeting on January 15, 1992. O. Sage Wightman III was elected to serve as president for a second year term. Also elected for another year were John K. Wallace, Jr., first vice president; and William H. T. Bush, second vice president.

New Term Trustees elected at the meeting were Parker B. Condie, formerly president of Leppert Roos Fur and Apparel Company, and M. Peter Fischer, a partner in Fischer and Hawker, attorneys at law. Margaret B. Oberheide and Marion K. Piper were named Emeritus Trustees. Mrs. Oberheide has served on the Board since 1984, and Mrs. Piper joined the Board in 1981.

Michael S. Olson, the Garden's controller, is secretary to the Board, and Cheryl B. Mill is assistant secretary. Also named as an officer was Frank P. Wolff, Jr., who was named Counsel to the Board.

Frank Wolff Named Counsel

Frank Wolff has represented the Garden since 1971. In fact, he began his work the same day Peter and Tamra Raven joined the Garden. Wolff has been principally responsible for the Garden's legal affairs since 1980. He is a partner with the St. Louis law firm Bryan Cave.

A native St. Louisan, Wolff graduated from Middlebury College in 1968 and from University of Virginia Law School in 1971. In his twenty years representing the Garden he points out that "I have had the good fortune to sit with the Board of Trustees and to work closely with each of the Board presidents. I am particularly proud that during this period the Botanical Garden Subdistrict was established, ensuring the Garden's long range financial welfare. It has also been a special privilege to work with the terrific Garden staff, both past and present, assembled by Peter Raven, including Bill Klein, Rick Daley, Alan Godlewski, Charles Orner, Pat Rich, Marshall Crosby, Paul Brockmann, Nancy Morin, Marcia Kerz and Sue Wilkerson, Mike Olson and most recently Jim Corbin, to name only those with whom I have worked regularly."

He concluded, "Representing the Garden has always been a special pleasure for me. I am deeply honored by the Board's action."

Frank P. Wolff, Jr.

SAFETY AWARD—Garden employees were honored by SAFECO Insurance with a Loss Control Achievement Award last fall for efforts to make the Garden grounds safer. Taking part in the award ceremony were (left to right): John Shaw, Northeast region commercial lines underwriting manager; Michael Olson, Garden controller; Paul Brockmann, Garden director of general services; Rick Halpern, SAFECO agent; Tom King, safety/security manager for the Garden; and Don Sekarski, loss control manager.

Trustee Profile

George E. Thoma

In January, Dr. George E. Thoma was appointed to the Garden's Board of Trustees as an ex-officio member. Thoma is the new president of the St. Louis Academy of Science, named to the post in December 1991. Under the terms of Henry Shaw's Will, the president of the Academy and his successors are to serve on the Garden's Board by virtue of their position.

The St. Louis Academy of Science, established in 1859, seeks to educate and inform the public about science. Thoma has been active in the Academy for ten years, and succeeds Thomas O. McNearney, Jr. as president.

A graduate of the University of Dayton with a B.S. in chemistry, Thoma earned an M.D. from St. Louis University. He has held several posts at St. Louis University Medical Center where currently he is Professor of Hospital and Health Care Administration. "I am delighted by the appointment to the Garden's Board and I look forward to serving with a number of persons with whom I share similar interests," Thoma said.

Dr. Peter H. Raven, director, said, "We are certainly pleased to include Dr. Thoma as a Garden Trustee. With his distinguished background in the fields of medicine and science, he will add much to our deliberations."

Thoma has lived in St. Louis County since 1943. He is active in many local and national organizations, including the United Way of Greater St. Louis, Independence Center, Mark Twain Summer Institute, Midtown Medical Center Redevelopment Corporation, Missouri State Board of Health, and American Medical Association. Thoma was a founding editor of *The Journal of Nuclear Medicine* and a founder of the St. Louis Technology Center.

In addition to his professional pursuits, Dr. Thoma is an avid herb gardener.

Glover Stewart (left) and Charisse Jackson, students at Harris-Stowe State College, have been hired to work at the Garden under a new internship program funded by Adelaide and Dan Schlafly. Each year two sophomore or junior level students from Harris-Stowe will spend 20 hours a week at the Garden each semester, working with Garden staff on projects related to their studies. Glover is planning to teach elementary and middle school math and science, and Charisse will earn her degree in middle school science education.

From the Garden Gate Shop

Spring Plant Sale

Members' Pre-Sale
Thursday & Friday, April 23 & 24, 1992
9 a.m. to 6:30 p.m.

Public is invited
Saturday & Sunday, April 25 & 26, 1992
9 a.m. to 5 p.m.

The Shop and the Orthwein Floral Hall will be filled with a glorious display of the latest selections for your home and garden. Members enjoy 20% savings, all four days, on herbs, perennials, bedding plants, roses, begonias, geraniums, azaleas and summer blooming bulbs. Come early!

Easter Shopping

Easter falls on April 19 this year, so the Shop will be brimming with colorful blooming plants for spring and summer, just in time for your holiday celebration. The Shop also will have a huge selection of lovely Easter decorations and delightful toys.

James S. McDonnell Foundation Grant Received

In December 1991, the James S. McDonnell Foundation awarded a $100,000 three-year grant to the Garden's *Flora of China* project. The announcement came in recognition of Dr. Peter H. Raven's 20th anniversary as director of the Garden (see November/December *Bulletin*).

The *Flora of China* is a joint Sino-American project to publish for the first time in English a revised Flora based on *Flora Reipublicae Popularies Sinicae.* Twenty-five volumes are planned, with the first volume scheduled for publication later this year. It is anticipated the entire project will be completed in about 15 years.

In making the award, the Foundation cited the *Flora of China* project as a very important international initiative. Dr. Raven acknowledged the Foundation's donation was a substantial boost to the effort and added, "I deeply appreciate the Foundation's generous financial assistance and commitment to join with the Garden to underwrite this timely project."

As reported in the November/December issue of the *Bulletin*, Garden Trustees responded enthusiastically in recognizing Dr. and Mrs. Peter H. Raven's 20th anniversary at the Garden. Gifts totalling $1.5 million were received to mark the milestone, earmarked to support the further development of the research database system at the Garden, including the Floras of North America and China.

Tributes NOVEMBER - DECEMBER 1991

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MEMBERS' PREVIEW

Spring

FLOWER SHOW

Friday, March 6, 1992

5:00 TO 8:00 P.M.

RIDGWAY CENTER

Step out of winter and into springtime! Meandering paths lined with dogwoods, redbuds and forsythias lead to a charming old mill and mill pond. Violets, jack-in-the-pulpits, astilbes, delphiniums, bleeding hearts, shooting stars, hostas and more fill the air with color and scent. Entertainment, fashions by Episode of the Galleria, cash bar. The Garden Gate Shop will be open. Dinner Buffet will be available in the Gardenview Restaurant. For members only.

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MBER THREE

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We celebrate summer with Purple Martins, Rose Evening, concerts, flower shows and extended hours.

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13 **Japanese Beetles**
These voracious pests have arrived in St. Louis. Be prepared!

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19 **Center for Plant Conservation**
The Science Advisory Council held its annual meeting at the Garden.

On the cover: A rose is a rose . . . especially on Rose Evening. See the Calendar of Events, page 10.

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The BULLETIN is sent to every Member of the Garden as one of the benefits of membership. For a contribution of as little as $40 per year, Members also are entitled to: free admission to the Garden, Shaw Arboretum, and Tower Grove House; invitations to special events and receptions; announcements of all lectures and classes; discounts in the Garden Gate Shop and for course fees; and the opportunity to travel, domestic and abroad, with other Members. For information, please call (314) 577-5100.

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Comment

Welcoming Spring and Summer

Struggling with a few false starts and some confusion, spring finally arrived and the Garden grounds weathered the transition well. The plantings throughout the various gardens are lush and green.

The beauty of spring and summer at the Garden ushers in a host of activities. The traditional events for members, Purple Martin Evening, the Mother's Day luncheon, and Rose Evening, are always popular and delightful. (See page 10.) In addition, this summer we are hosting the first Rosy Periwinkle Festival, a celebration of plants that have benefitted society with their medicinal value (see back cover). And I encourage you to bring your favorite child to the marvelous "Bug's Eye View" exhibit in the Brookings Interpretive Center (see page 13).

The Garden wishes to congratulate KMOV-Channel 4 for its efforts in helping everyone better comprehend the effects of the loss of the rain forest. I do hope you were able to view the Channel 4 March documentary "Rescuing the Rain Forest: The St. Louis Connection." It was an informative presentation about what the Garden, the Science Center, and the Zoo are doing and listed helpful tips on how each individual can participate in helping to "Rescue the Rain Forest." A special congratulations to the producer, Al Frank.

As the Garden approaches a record-breaking membership of 30,000 families, it is imperative to thank you for your gracious assistance and support. It is because of your involvement that we have been able to move ahead and provide more valuable information about plants and plant diversity, and offer a beautiful and serene setting for visitors throughout St. Louis to enjoy.

We hope to see you at the spring and summer events.

Peter H Raven

"MORE THAN YOU'D IMAGINE"—A recent television campaign highlighted the Garden's contributions to the community in education and research and the importance of plants to society. In one spot, pictured above, Judy Diesel and her daughter Lacey of Millstadt, Illinois, explained that Lacey is being successfully treated for childhood leukemia with a drug developed from the rosy periwinkle plant. The Garden works closely with the National Cancer Institute to find plants that may someday successfully be used to treat the world's deadliest diseases.

IN MEMORIAM

Charles Claude Johnson Spink

1916—1992

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GARDEN LIBRARY

On March 26, the Garden's Board of Trustees lost a longtime friend and colleague, C.C. Johnson Spink. From his appointment to the Board in 1974 and, especially, as Board President 1982 through 1984, Mr. Spink provided important leadership during the Garden's most significant period of expansion in facilities and services since its founding in 1859.

"Johnson Spink served the Garden with enthusiasm and affection. It would have been unthinkable for him to treat a cause in which he believed in any other way," observed O. Sage Wightman III, current President of the Board of Trustees. "His talents and energy were especially evident during his tenure as President, when a number of highly significant projects were launched or concluded."

Two of these projects were destined to have tremendous impact on the future of the Garden. The construction and 1982 dedication of the Ridgway Center, the Garden's 60,000 square-foot main entrance and visitor center, enabled the Garden to serve an attendance now approaching one million visitors annually through exhibits and events, education programs, and the Garden's gift shop and restaurant. A special feature of the Ridgway Center is the Spink Gallery, which displays on a rotating basis one of the world's finest collections of porcelain birds, flowers, and other natural history subjects from the studios of Edward Marshall Boehm. The Gallery, the porcelain collection, and their upkeep were a generous personal donation to the Garden from Mr. and Mrs. Spink.

Mr. Spink was also at the Garden's helm during the successful 1983 campaign for voter approval to enter the Garden as a subdistrict of the St. Louis Metropolitan Zoo-Museum District, a unique property taxing district encompassing St. Louis City and County to support several local museums. Subdistrict funding has made it possible for the Garden to reduce admission fees while broadening the range of community programs and services.

A contribution from Mr. and Mrs. Spink permitted the Garden to renovate its original entry, the beautiful, intimate Flora Gate, into a facility for meetings and events. It was reopened in 1989 as the Edith and Johnson Spink Pavilion, dedicated to Blanche and J. G. Taylor Spink and Isabel and William Jenkin, Mr. and Mrs. Spink's late parents.

"Johnson Spink's name is synonymous with the highest degree of philanthropy and community service, to which he was devoted throughout his life," said Dr. Peter Raven, the Garden's director. "The sale of *The Sporting News*, the Spinks' venerable old family business, to the Times Mirror organization in 1977 enabled Johnson to retire and focus even more on efforts to benefit our community. Besides his service to the Garden, he was a magnificent patron of the arts and was active in nearly every major cultural organization in our community, as well as the American Red Cross and the Church of St. Michael and St. George. St. Louis has truly lost a great friend and benefactor."

Far left: The new entrance benches.

Left: The refurbished gazebo and gates.

THE JENNIE LATZER KAESER MEMORIAL MAZE

A-Mazing!

IN the 1860s Henry Shaw constructed a Victorian maze in Tower Grove Park. These charming constructions, beloved of English gardeners for centuries, are recalled today in the splendid Kaeser maze, which stands on the southeast side of Tower Grove House.

The Jennie Latzer Kaeser Memorial Maze was made possible by a bequest from Mrs. Kaeser and a gift from Mr. and Mrs. Vernon W. Piper, Mrs. Kaeser's daughter. The maze was dedicated in 1987 and has been a popular feature with visitors ever since.

This past fall some significant improvements were undertaken to further enhance the beauty and function of the maze. All of the walkways were laid with handsome brickwork, and a pair of benches were placed at the entrance. Planters to accompany the benches are on order from England. All of the gates and the gazebo in the center have been painted green to blend with the tall hedges, and the gates have been altered so that their positions can be fixed and changed from time to time, making it more challenging to find the path through the maze.

The alterations and improvements to the maze also were made possible by the generosity of Mr. and Mrs. Piper. All visitors are charmed by the maze, and whether one wanders through it slowly for spiritual refreshment or races through to solve the puzzle, the riddle of the maze is a delight to all.

Cultural Diversity Council at MBG

Staff members serving on the Garden's Cultural Diversity Council (front row, from left: Mike Mosley, Sandra Rode, Brenda Banjak, Marcia Kerz, Mary Middleton, Mary Lawrence. Second row, from left: Douglas Arnold, Deborah Graham, Sue Wilkerson, Donna Bruner, Amada Gonzalez, Susan Smith, Audrey Sanders. Third row, from left: Chris DePalma, Dorothy Clay, Jeanne McGilligan, Ken Barnes, Mike Olson, Paul Brockmann, Ben Chu, John MacDougal, Ishan Al-Shehbaz. Back row, from left: Larry DeBuhr, Peter Raven, Walter Nichols. Not pictured: Alicia Ivory House, Barbara Addelson, Tina Short, Cheryl Mill, Debbie Kama.

Monsanto Fund Supports New Programs at Kemper Center for Home Gardening

A THREE-YEAR, $200,000 grant from Monsanto Fund has made it possible for the William T. Kemper Center for Home Gardening to develop and implement two new service programs: one to teach community residents how to manage their yard wastes through composting, and the other, an internship program for Lincoln University minority students who are interested in exploring careers or advanced study in horticulture, botany, and related fields. With this grant, Monsanto Fund continues and expands its support for the Center. A generous $750,000 gift from Monsanto Fund in 1987 played a major role in the building's construction.

The program grant spans the period September 1991 into 1994. It reflects the commitment of Monsanto Fund to projects addressing environmental concerns and science education, direct corollaries of the company's mission.

"The Garden has traditionally offered people at all levels of study, from casual visitors to professional botanists and biologists, singular opportunities to understand plants and their crucial place in the natural world," observed Dr. John L. Mason, Vice-President, University Relations and Equal Employment for Monsanto Company and President, Monsanto Fund. "The Center for Home Gardening, which epitomizes that breadth of service, is an important investment for us. We are proud to have provided support integral to the construction of the Center and to expand our relationship by sponsoring these new programs."

The Master Composter Program is truly a timely offering, as the state's Solid Waste Law banning yard wastes from landfills took effect on January 1. Based on a successful Seattle model, the Garden's program trains volunteer Master Composters to give community residents the knowledge, skills, and materials to manage their yard wastes in environmentally productive ways. The Master Composters accept speaking engagements, offer in-person advice at the Center for Home Gardening, staff the Center's telephone composting hotline, and conduct classes at demonstration sites being established in parks and other public settings around the St. Louis area.

To date, 110 Master Composters have been trained and two demonstration sites have been set up, in downtown Kirkwood and Carondelet Park in south St. Louis City. A third demonstration site for the public is now being developed on property owned by Monsanto Company in West St. Louis County. At this site, local Monsanto employees will also have the opportunity to get composting training, a potential model for other Monsanto operating locations.

The grant has also made it possible for the Center to produce a composting training video, suitable for either commercial broadcast or consumer use and soon to be available from the Garden.

The Lincoln University Intern Program targets minority undergraduate students enrolled in its Agriculture Department, with the goal to better acquaint them with career options in the botanical and horticultural sciences and to stimulate interest in pursuing advanced degrees in these or related fields. Commented Dr. Peter Raven, the Garden's director, "As environmental problems mount, the sciences must be able to call on the broadest base of new intelligence and talent to help develop solutions. That women and ethnic minorities have traditionally been discouraged from entering the sciences is no longer simply a historic disgrace, it is a situation that cannot be tolerated if we are to face the future with any degree of confidence. The Lincoln intern program joins a number of similar efforts at the Garden to make learning opportunities accessible to qualified yet disadvantaged individuals."

Under the program, interns will be recruited in their freshman year and spend each of four summers through graduation as full-time temporary employees of the Garden. Academic requirements met during this time will also gain them college credit hours. One to two new freshmen will be recruited each year, ensuring that all academic levels are ultimately represented and that older students will develop leadership skills by serving as mentors, if not supervisors, of newer arrivals. From the first year spent in gaining horticultural experience, students will rotate into other Garden departments, such as research, education, public relations, public events, and development. This will allow the students to devote in-depth time to career areas of particular interest relative to their emerging academic goals.

"The Center for Home Gardening has been on the drawing board for more than two decades, and words cannot describe how good it feels to finally be involved in developing and presenting programs to the public," concluded Dr. Steven Cline, the Center's manager. "Monsanto Fund has our deepest gratitude for helping us realize these long-held dreams."

Chip Tynan of the MBG Horticultural Answer Service (center) leads a class in composting at the Kemper Center.

McDonnell Douglas Foundation Funds Eco-Cart Science Demonstrations

THE McDonnell Douglas Foundation has agreed to support the Garden's interactive science education program for kindergarten through grade 12, with a grant of $150,000 over three years. The grant will provide for development of three carts to be used for science demonstrations for groups visiting the Climatron and Brookings Interpretive Center. The carts are scheduled to be ready by the opening of the new educational exhibits in the Brookings Center in 1994 (see the *Bulletin*, March-April 1992).

The McDonnell Douglas Foundation, in a joint $750,000 gift with the Employee Charity and Community Services Plan of McDonnell Douglas St. Louis, was one of the largest contributors to the recent capital campaign that renovated the Climatron and built the Brookings Center. The current grant extends that investment in environmental education to benefit the St. Louis community and beyond.

"The McDonnell Douglas Foundation, the Corporation and its employees have been steadfast friends of the Garden for many years," said Dr. Peter H. Raven, director. "This generous support will help us to move ahead with our program to assist in improving science education."

Dr. Larry DeBuhr, director of education at the Garden, added, "Children and adults find the displays in the Climatron much more meaningful when we can actually demonstrate the scientific concepts portrayed. The carts will contain supplies and materials for interactive activities and can be moved to appropriate locations within the Climatron complex. We will have printed materials for use by teachers in the classroom as well."

Ten topics will be developed by Garden education staff. The demonstrations will be tested with school children throughout the process. The topics are:

Decomposition and Nutrient Cycling—the role of microorganisms in the environment and how soil is produced.

Energy: First and Second Laws—basic physical science concepts that have important applications to global energy flows, including global warming and the high cost of world energy resources.

Changes in Matter: Chemical Reactions—interesting chemical reactions will help illustrate acid rain or the polymerization of latex into rubber products, for example.

Plant and Animal Adaptations—The relationships among the structure of organisms, the habitats they live in, and the niches they occupy, is a fundamental science concept in biology.

Photosynthesis—how plants are able to convert light energy into chemical energy, and thereby produce food for all other organisms.

Food Chain—an important ecological concept that can be presented in relation to the fish tank in the Climatron and the "Ant and Acacia" exhibit planned for the Brookings Center.

Changes in the State of Matter—The change from solids to liquids and gasses helps explain many important biological and ecological concepts and helps to illustrate weather and climate.

Heat Transfers: Convection, Radiation, and Conduction—The three ways that heat is transferred are important concepts for understanding global climate patterns and global warming.

Water Cycle—how matter cycles in the environment, how clouds form, how rain condenses from water vapor, evaporation and condensation.

Changing Seasons—the relationship between the tilting and rotation of the Earth on its axis, the revolution of the Earth around the Sun, and the changing seasons.

The Eco-Cart Demonstrations will be an exciting innovation in science education and the Garden is deeply grateful to the McDonnell Douglas Foundation for making the program possible.

Cousteau Visits the Garden

Jacques Cousteau (right) and Peter Raven filming for the television special.

This past March, Captain Jacques Yves Cousteau, undersea explorer and naturalist, visited the Garden to interview Dr. Peter H. Raven for an upcoming television special on the world summit on the environment to be held in Rio de Janeiro this summer.

"It is a special opportunity for the Garden to welcome such a visitor as Capt. Cousteau," said Dr. Raven. "He has taken us to far off and exotic worlds, worlds filled with creatures and life rare and splendid."

The film crew spent the day shooting scenes in the Climatron of endangered plants and tropical flowers. The interview focused on the environment and what scientists are doing to help influence the world's governments to act in defense of the planet. Capt. Cousteau will be interviewing other prominent international scientists to present a variety of viewpoints from scientific leaders throughout the world. The television special will air in late June or early July on the Turner Broadcasting cable network. Watch local listings for exact time and date.

Although Capt. Cousteau has not been actively pursuing adventures on the high seas, the Cousteau Society continues to work on exploration and discovery projects all over the world. This year is the 50th anniversary of the launching of the Calypso, Capt. Cousteau's famed exploration vessel.

Capt. Cousteau received the World Ecology Medal from the University of Missouri-St. Louis during his stay in St. Louis.

From left: Dr. David Mahan, superintendent of St. Louis Public Schools; Dr. Larry DeBuhr, MBG director of education; Alicia Ivory House, MBG education staff; Melva Ware, RCAC co-director; Charles Sims, assistant superintendent for middle school education.

ALL CITY MIDDLE SCHOOL Science Fair

"EFFECTS of Acid Rain"..."Antibiotics Versus Bacteria"..."Chromatography." These are just a few of the student projects displayed at the first annual All City Middle School Science Fair held at the Garden March 12-14, 1992.

Co-sponsored by the Garden and St. Louis Public Schools in conjunction with the Regional Science and Technology Career Access Center (RCAC), the science fair is a new program designed to encourage urban science students in grades 6-8. Three projects per school were chosen by teachers, with 26 schools participating.

"Many students and teachers have not had an opportunity to visit a science fair or to learn how to develop good projects," said Alicia Ivory House of the Garden's education staff, coordinator of the fair. "The judges evaluated every project on a number of criteria, from appearance to scientific accuracy, and students received their evaluation scores and comments. At the awards ceremony every student received recognition for his or her efforts, with the most ribbons going to projects that were successful on many levels. The top ranked student from each school received a trophy, and their teachers were recognized as well."

On March 13 enthusiastic students from 25 of the 26 participating schools visited the Garden to view the Science Fair and the work of their classmates. "It was a top notch production," said Edward P. Ortleb, science supervisor of St. Louis Public Schools. "I am sure that there are many students and parents who are walking a little bit taller because of this science fair experience."

Charles W. Sims, assistant superintendent for middle school education, said, "Also...we recognize the contributions of middle school administrators and teachers ...responsible for assisting in planning and carrying out...the first All-City Middle School Science Fair."

Projects represented 12 categories: biochemistry, botany, chemistry, computer science, Earth and space science, engineering, environmental science, mathematics, medicine and health, microbiology, physics, and zoology. The 13 judges and the committee of 15 educators were drawn from St. Louis public schools, colleges, universities, and the Garden staff.

"We are especially grateful to Melva Ware, co-director of RCAC at University of Missouri-St. Louis," said Dr. Larry DeBuhr, the Garden's director of education. "Without their support the Science Fair would not have been possible."

Community Beautification Awards

Shown at the awards ceremony (front left): Deborah Graham, Manager of MBG Public Programs and Public Events; Patricia Barrett, Vice-President Corporate Communications, Union Electric; and award winners Reginald Williams, Frances Byrd, Donna Ransom, Eula Toney Jones, and Vera Strong.

Five local African-Americans were recognized for their significant contributions to local beautification projects in a ceremony and reception on Sunday, February 16 at the Garden. The Awards were sponsored by the Garden and Union Electric Company. This is the second year the two organizations have teamed together to present the awards program as part of the Garden's Black History Month activities. The winners beautified their neighborhoods through clean-up, gardening, and reforestation.

The 1992 winners were: Frances Byrd, Fairground Neighborhood; Eula Toney Jones, Ville Neighborhood; Donna Ransom, West End Area; Vera M. Strong, Jeff Vander Lou Neighborhood; and Reginald A. Williams, Wells-Goodfellow Neighborhood.

Representatives from the following organizations served on the selection committee: Gateway to Gardening Association, Human Development Corporation, Neighborhood Housing Services, Operation Brightside, Operation ConServ, the Urban League of Metropolitan St. Louis, Union Electric Company, the Garden, and the 1991 Honorees.

Home Gardening

Planting Trees and Shrubs

PURCHASING PLANTS

Trees and shrubs are available from suppliers in four ways: bare-root, container grown, balled-and-burlapped (B & B), and potted.

Bare-root plants, as the name implies, are without soil. They are generally available only in early spring. It is best to plant as soon as possible once received. Soak the roots for six to twelve hours before planting.

Container grown plants have been grown in containers. They are available spring to fall and can be planted if kept watered and protected from extremes of weather. When planting, remove the plant from the container even if it is a ''plantable'' container. Slice down each of the four sides of the root ball about one inch deep to cut circling roots and encourage new root growth.

Balled-and-burlapped and potted plants are field grown, then dug and wrapped with burlap or placed in a pot. They have a reduced root system but if properly root pruned at the nursery will have many small-feeder roots in the soil ball. They can be planted any time they are available; generally spring through fall. Remove the burlap if it is the plastic type. Fabric burlap need not be removed, but cut and remove all ropes or wire and roll down the burlap so it is completely covered by soil.

WHEN TO PLANT

Most trees and shrubs are planted in early spring but summer and fall planting can also prove successful. Planted in early fall, plants establish new roots before the ground freezes and continue in spring before top growth begins. Plants subject to winter injury such as rhododendrons, evergreen azaleas and needled evergreen should not be planted too late in the fall as damage from drying winter winds can result. Providing a burlap wind break can help.

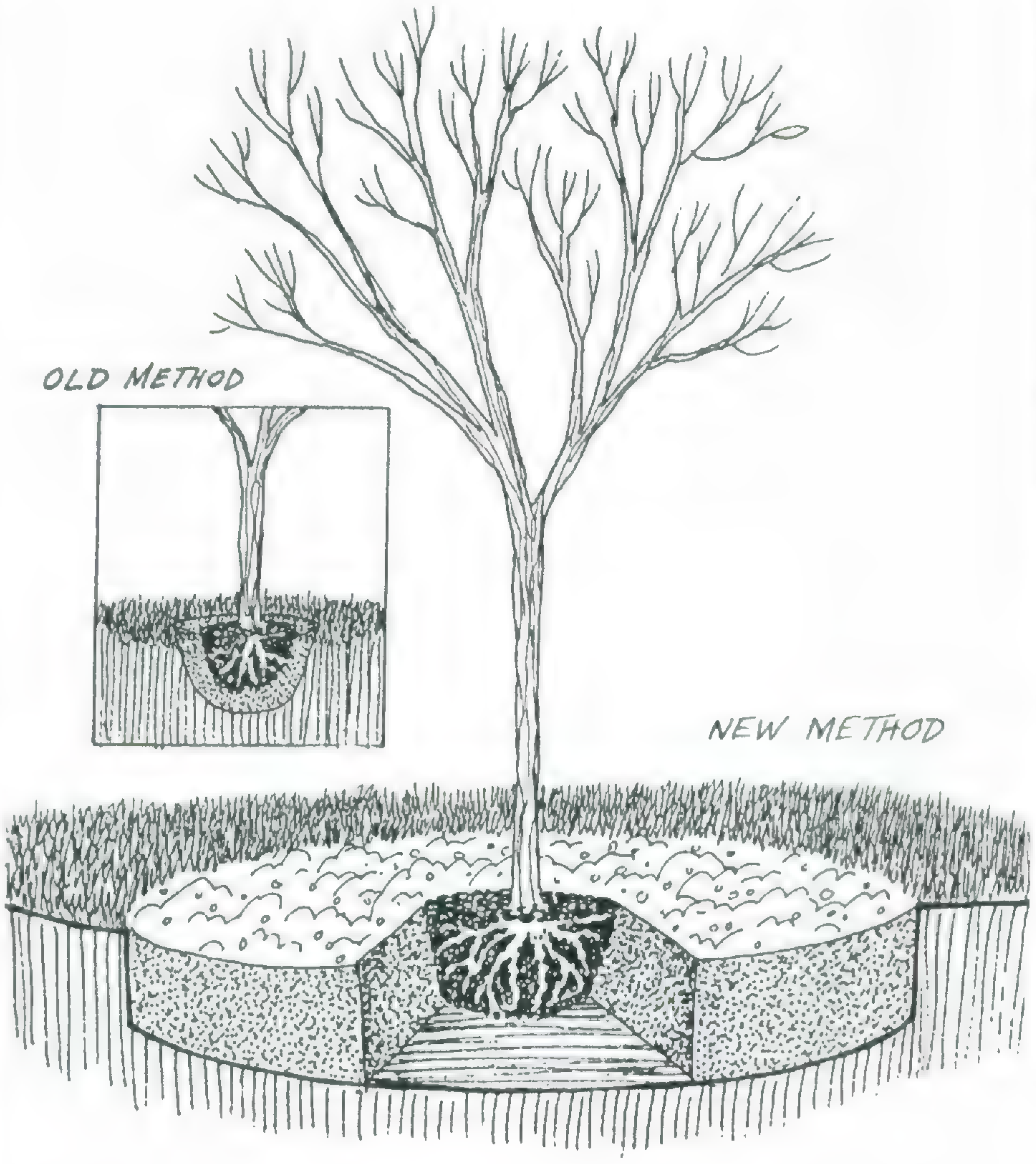
SUMMER PLANTING

Busy gardeners rarely have the time to get their planting done on time and ''by the book.'' So, frequently summer planting is needed. It is more challenging but with care plants purchased balled-and-burlapped, potted or container grown can be brought through with excellent success. The plant's water demands are very high at this time so special care is needed to prevent the plant from drying to a crisp before you realize it. To help assure success follow these steps.

At planting time, spray the foliage with an antitranspirant such as Wilt-Pruf. Antitranspirants reduce water loss from the leaves and buy extra time while the plant develops new roots. Follow label directions carefully and spray the entire leaf surface, both top and bottom.

For added protection of tender plants, construct a barrier around the plant from an old sheet to shade the plant and protect it from drying winds. Spray the plant and sheet periodically with water until the plant is established. Water as needed to keep the soil moist. Turning on a sprinkler can reduce moisture loss and cool the plants during hot dry weather.

Mulching and watering is also very important. Follow the directions given below closely.



PLANTING METHOD

Until recently, common wisdom for planting trees and shrubs has been pretty standard —dig a hole six inches wider and deeper than the root ball, mix copious amounts of organic matter into the bottom of the hole and the soil removed from the hole, plant the tree or shrub and back fill with the amended soil.

Recent research is challenging the wisdom of this method. Trees planted in the old method often settle into the soft bottom soil resulting in the root system being too deep. Trees and shrubs should not be planted deeper than they were growing in the nursery. This level can be determined by locating the color change on the trunk of the tree.

The old method has also resulted in delayed rooting into the unprepared soil surrounding the planting hole. In effect the plant grows in a 'container' in the ground because the roots fail to leave the well prepared soil. The plant thrives for a short time and then develops slowly or dies.

Because of these problems, planting recommendations are changing. The new method advocates that the *hole be dug only as deep as the root ball is high* and the soil be *loosened to a depth of twelve inches in an area at least four to five times as wide as the root ball*. Work soil amendments into this entire area, not just close to the root ball. If the tree is to grow and flourish it must develop roots beyond the planting hole. Your goal should be to facilitate this process. Either prepare the whole area or do not amend the soil at all.

This ''total area'' improvement method has been the standard recommendation for shrub, perennial and annual bed preparation for many years. If anything, research is reinforcing the need for this practice.

MULCHING

After planting, mulch the entire spaded area with three to four inches of organic mulch such as shredded bark, compost or leaf mold. Mulch keeps the soil cool, retains moisture, adds nutrients as it decomposes and prevents competition from grass. Do not mound mulch around the trunk. This can result in disease, insect and rodent damage. Instead keep the mulch three to four inches away from the trunk.

WATERING

Water the entire soil area well. Check water needs regularly. Newly planted trees need frequent watering in hot, dry weather. When the plants begin to establish, gradually reduce the frequency of watering to once every ten days to two weeks depending upon rain fall. Do not keep the soil soggy. Water the entire mulched area to encourage lateral rooting.

STAKING

Most newly planted trees and shrubs do not need staking. Some top movement of the plant is beneficial for the development of a strong trunk and root system. Staking should only be done if the plant is at risk of being toppled by wind. If this is a danger, supply minimal support for the first year until the plant is established. Be sure the support does not cut into the trunk of the tree.

PLANTING EXCEPTION

The new method of planting has many advantages but there are still times when the old method can or should be used. The old method is a necessity when growing small plants which require a special soil mix, such as azaleas. These plants, with special soil requirements, would not survive in unamended soil. For these plants, prepare a hole large enough to contain the root system of the *mature* plant and amend the soil to meet the plant's requirements.

—Glen Kopp, Coordinator of Adult Education Programs

Timely Tips from the Answer Service

Do you have a plant question? Call the Horticultural Answer Service, Monday through Saturday, 9 a.m. to noon, at ***577-5143.***

May Tips

- Pinch azaleas and rhododendron blossoms as they fade.
- If spring rains have been sparse, begin irrigating, especially plants growing in full sun.
- Begin planting gladiolus bulbs as the ground warms. Continue at two week intervals.
- Begin planting warm-season annuals and begin fertilizing them. Continue at regular intervals.
- Bulbs can be moved or divided as the foliage dies.
- Set out tomato plants as soils warm. Place support stakes alongside at planting time.
- Begin planting sweet corn as soon as white oak leaves are as big as squirrel ears.
- Keep bluegrass cut at 1.5 to 2.5 inch height. Mow tall fescues at 2.5 to 3.5 inch height. Mow zoysia lawns at 1.5 inch height. Remove no more than one-half inch at each mowing. Zoysia lawns may be fertilized now. Apply no more than one pound of actual nitrogen per 1,000 square feet.

June Tips

- Deadhead bulbs and spring flowering perennials as blossoms fade.
- Most houseplants brought outside prefer a bright spot shaded from afternoon sun. Check soil moisture daily during hot weather.
- Rhizomatous begonias are not just for shade. Many varieties, especially those with bronze foliage, do well in full sun if given plenty of water.
- Apply a balanced rose fertilizer after the first show of blooms is past.
- Trees and shrubs may still be fertilized before July 4th. Softwood cuttings can be taken from trees and shrubs as the spring flush of growth is beginning to mature. Pruning of spring flowering trees and shrubs should be completed before months's end.
- Plant pumpkins now to have Jack-o-lanterns for Halloween.
- Late in the month start seedlings of broccoli, cabbage and cauliflower. These will provide transplants for the fall garden.
- Soaker hoses and drip irrigation systems make the most efficient use of water during try times.
- To maximize top growth on asparagus, after harvest apply two pounds of 12-12-12 fertilizer per 100 square feet, water well and renew mulches to conserve moisture.
- A mailbox mounted on a nearby post makes a handy place to store any small tools, seeds, labels, frequently used in the garden.

—Chip Tynan, The Answer Service

Garden Floral Designer Named Illinois Designer of the Year

Pat Diehl Scace, floral designer for the Missouri Botanical Garden, was named "Designer of the Year" at the annual convention of the Illinois State Florists Association, March 1, 1992.

The Designer of the Year is the florist who receives the highest cumulative total of points in a three-category floral design competition. Scace received three firsts and one third, with the highest point total. As Designer of the Year, Scace will participate on a design panel at the 1993 convention, performing with two other designers at design sessions at the convention.

"This distinction, coupled with last year's AIFD acceptance, brings great honor to the Garden," said Shannon Smith, the Garden's director of horticulture. "We're very proud of Pat." Scace was accepted into the prestigious American Institute of Floral Designers in 1991. She will be inducted at that organization's annual meeting in July 1992.

Missouri Botanical Garden

CALENDAR OF EVENTS

May-June 1992

Monday, May 25/Memorial Day

Summer Hours Begin From now through Labor Day enjoy extended Garden hours until 8 p.m. daily.

Friday, May 29/Rose Evening

5:30 to 8:30 p.m., grounds. This very popular and lovely event features the beautiful Lehmann and Gladney rose gardens. Garden horticulture staff will be on hand to answer questions on rose care. The evening includes music, a free rose care brochure, a film on growing and care of roses, and an optional buffet supper. Special attendance gift. Watch your mail for a special invitation. For members only.

WALKING TOURS
Every Tuesday, Saturday and Sunday 1:00 p.m.

Join the Garden Guides for a tour of the grounds, featuring the art, architecture, history and horticulture of the Garden. Meet at the ticket counter in the Ridgway Center. Free with regular Garden admission.

MAY

2 SATURDAY

13th Annual Storytelling Festival "Sparks by the River: Dreams and Destiny"

2 p.m., Shoenberg Auditorium. Nationally recognized storytellers Elizabeth Ellis, Gayle Ross and Twelve Moons Storytellers share tales of Native America and the Appalachian Mountains. Free with Garden admission.

Ernst Haas Exhibit

9 a.m. to 5 p.m. daily, Ridgway Center. Floral works produced especially for the Missouri Botanical Garden by the late world renowned photographer Ernst Haas. Free with Garden admission.

2-3 SATURDAY-SUNDAY

African Violet Council Show

9 a.m. to 5 p.m. daily, Orthwein Floral Hall. The Metropolitan St. Louis African Violet Council hosts its 38th annual juried show celebrating "100 Years of Violets." Displays of all sizes, colors and planting arrangements, plus educational, membership, and sales booths. Free with Garden admission.

5 TUESDAY

Lewis & Clark Trail Tour Preview

7:30 p.m., Shoenberg Auditorium. Join Dr. Ray Breun of the Riverlands Association for a lecture on the tour coming up June 12-25, 1992. Call 577-9500 for information on this exciting trip. Lecture is free.

7 THURSDAY

Santa Fe Trail Tour Preview

7:30 p.m., Ridgway Center. Join Dr. Marshall Crosby, assistant director of the Garden, for a lecture on the tour coming up July 20-29, 1992. Call 577-9500 for information on this exciting trip. Lecture is free.

7 THURSDAY

Benefit for Seacology Foun

5:30 p.m. cocktail reception;
p.m. film and discussion; Rid
Center. The Garden hosts the
American premiere of "Nafar
Saving the Samoan Rainfores
film by the Seacology Founda
(see page 14). $30 per persor
Call 577-9500 for reservation

8 FRIDAY

"Bouquets to Mom"

Noon, under the outdoor ten
Ridgway Center. (Seating be
11:50 a.m.) A pre-Mother's
luncheon co-sponsored by Sa
and the Garden. A day of flow
fragrance and fashion for you
bed, bath and table. Special g
and attendance prizes from D
Body Results, Tiger's Eye, F
Paris, Sallie, and Gerber Lan
$35 members, $45 Non-mem
Call 577-9500 for reservation

"Nafanua: Saving the Sam Rainforest"

2 and 7 p.m., Shoenberg Aud
rium. A film featuring the wo
the Seacology Foundation. $
person, to benefit Seacology
dation.

9 SATURDAY

O'Fallon Iris Society Show

Noon to 5 p.m., Orthwein Fl
Hall. A juried show featuring
300 entries in seven classes.
with Garden admission.

"Nafanua: Saving the Sam Rainforest"

2 p.m., Shoenberg Auditoriu
See May 8.

ontinued

SUNDAY

r St. Louis
ciety Show

5 p.m., Orthwein Floral
spectacular array of both
ements and individual flowers
displayed and judged. Free
rden admission.

TUESDAY

ial Planning Panel
sion

to noon, Spink Pavilion. Join
s in estate planning. Discus-
free, but reservations are
d: call 577-9532.

16-17 SATURDAY-SUNDAY

St. Louis Horticulture Society Show

Noon to 5 p.m. Saturday; 9 a.m. to 5 p.m. Sunday, Orthwein Floral Hall. Vegetables and flowers are among the categories to be judged and displayed. Free with garden admission.

23-24 SATURDAY-SUNDAY

Rose Society Show

Noon to 5 p.m. Saturday; 9 a.m. to 5 p.m. Sunday, Orthwein Floral Hall. The Rose Soceity of Greater St. Louis will display hundreds of roses grown especially for this juried show. Free with Garden admission.

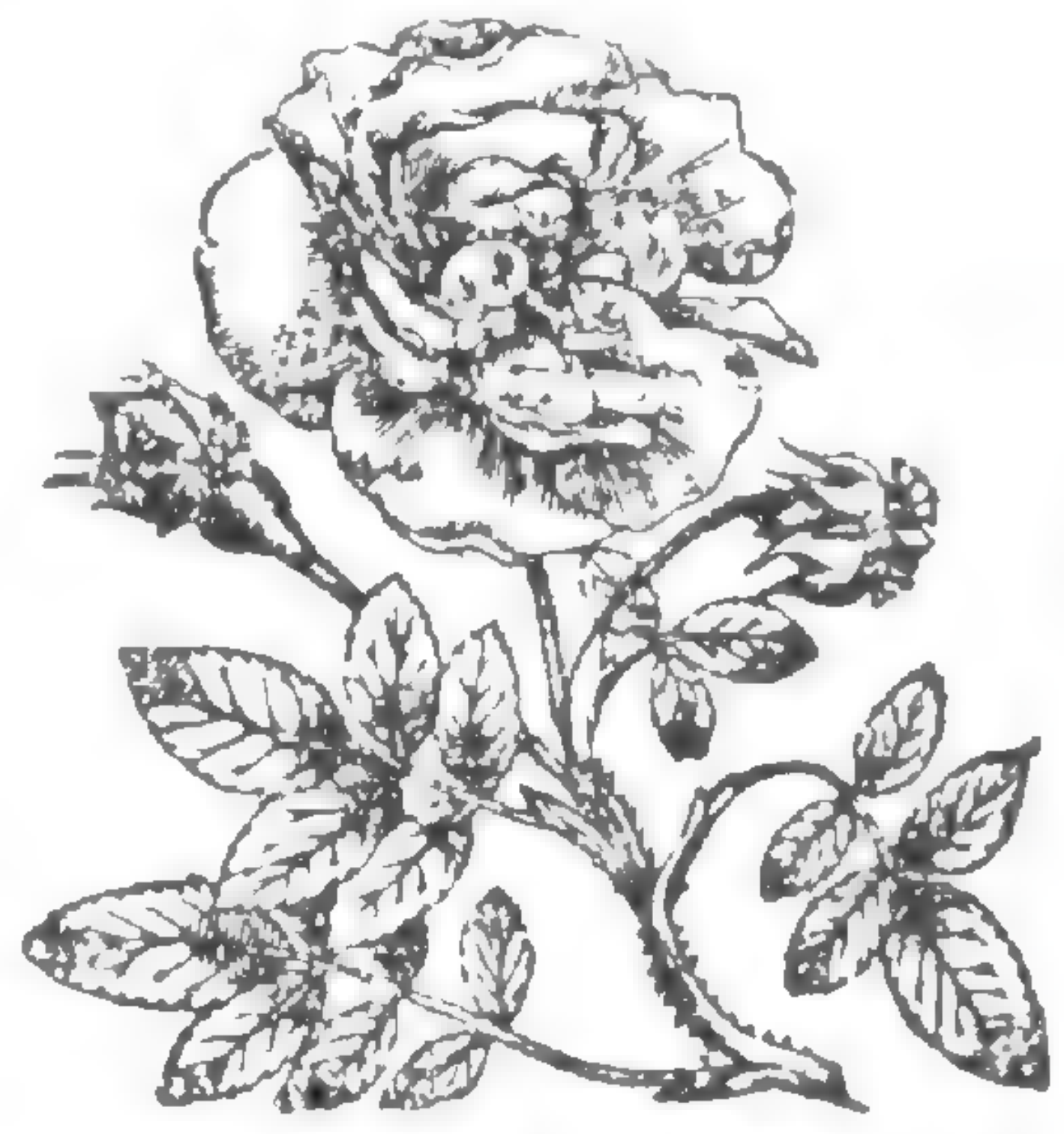
Everything's Coming Up Roses

9 a.m. to 5 p.m. daily, Ridgway Center and grounds. Films, lectures and tours of the rose gardens highlight this annual celebration of America's favorite flower. Free with Garden admission.

24-25 SUNDAY MONDAY

Dahlia Society Plant Sale

9 a.m. to 5 p.m. daily, Orthwein Floral Hall. The Greater St. Louis Dahlia Society offers an exciting selection of limited new cultivars and treasured favorites, varieties that consistently produce quality blooms and healthy foliage. Regular Garden admission.



MEMBERS' EVENTS

May 13 Members' Day "Purple Martin Evening"

6:30 p.m., Shoenberg Auditorium and grounds. The 11th annual celebration features a lecture and film followed by a stroll through the Garden's Purple Martin neighborhood. There will be a drawing for a Purple Martin house. Cash bar. No reservations are required, but seating for the film is limited. Free, for members only.

June 26 Members' Day "Members' Musical Evening"

5:30 to 9 p.m., Spoehrer Plaza. Bring a picnic supper if desired, and lawn chairs or blankets for seating. The popular Gateway City Big Band will perform your favorite songs and instrumentals. Concert starts at 7:30 p.m., limited concert seating will be provided. Cash bar available. Free, for members only.

JUNE

WEDNESDAY

n June

m., Cohen Amphitheater.
opular outdoor concert series
s some of the area's finest
nds. Lawn seating; blankets
n chairs are encouraged.
t's concert features the
renowned East St. Louis
n High School Jazz Band.
Garden members,
-members.

WEDNESDAY

n June

m. Featuring The Black
Society Jazz Ensemble
g Lillian Vann.
e 3.

WEDNESDAY

n June

m. Featuring the Eddie Fritz
uintet with vocalist Asa
and clarinetist Scott Alberici.
ne 3.

20-21 SATURDAY-SUNDAY

Lily Society Show

Noon to 8 p.m. Saturday; 9 a.m. to 5 p.m. Sunday, Orthwein Floral Hall. The Mid-America Regional Lily Society (MARLS) hosts its annual show. Both arrangements and individual flowers will be judged. Free with Garden admission.

21 SUNDAY

Showtime at the Garden

6:30 and 8:30 p.m., Shoenberg Auditorium. A city-wide talent show. Cash bar. Tickets are $3 members, $5 non-members, with children age 12 and under half price. Tickets may be purchased at the Ridgway Center Ticket Counter.

24 WEDNESDAY

Jazz In June

7:30 p.m. Featuring the swinging band sounds of The Jazz Edge with vocalist Denise Thimes. *See June 3.*

27 SATURDAY

Children's Art Exhibit

9 a.m. to 8 p.m., daily through June 26, Ridgway Center. "Children of the World Paint in a Single Language" is the theme of this exhibit by Paintbrush Diplomacy, featuring 77 pieces representing 38 countries by children ages 4 to 16. The works demonstrate the richness of the world's cultural diversity with themes including war and peace, festivals, animals, family and friends, and people at work. Free with Garden admission.

28 SUNDAY

West County Daylily Society Show

Noon to 8 p.m., Ridgway Center. Enjoy a colorful blooming array of these summertime favorites. Free with Garden admission.

Kemper Center for Home Gardening

Open 10 a.m. to 4 p.m. daily. Plant Doctor available 10 a.m. to noon and 1 to 3 p.m. Monday through Saturday. Free with regular Garden admission.

Master Composter Hotline: 314/577-9555

Tower Grove House Tea Room

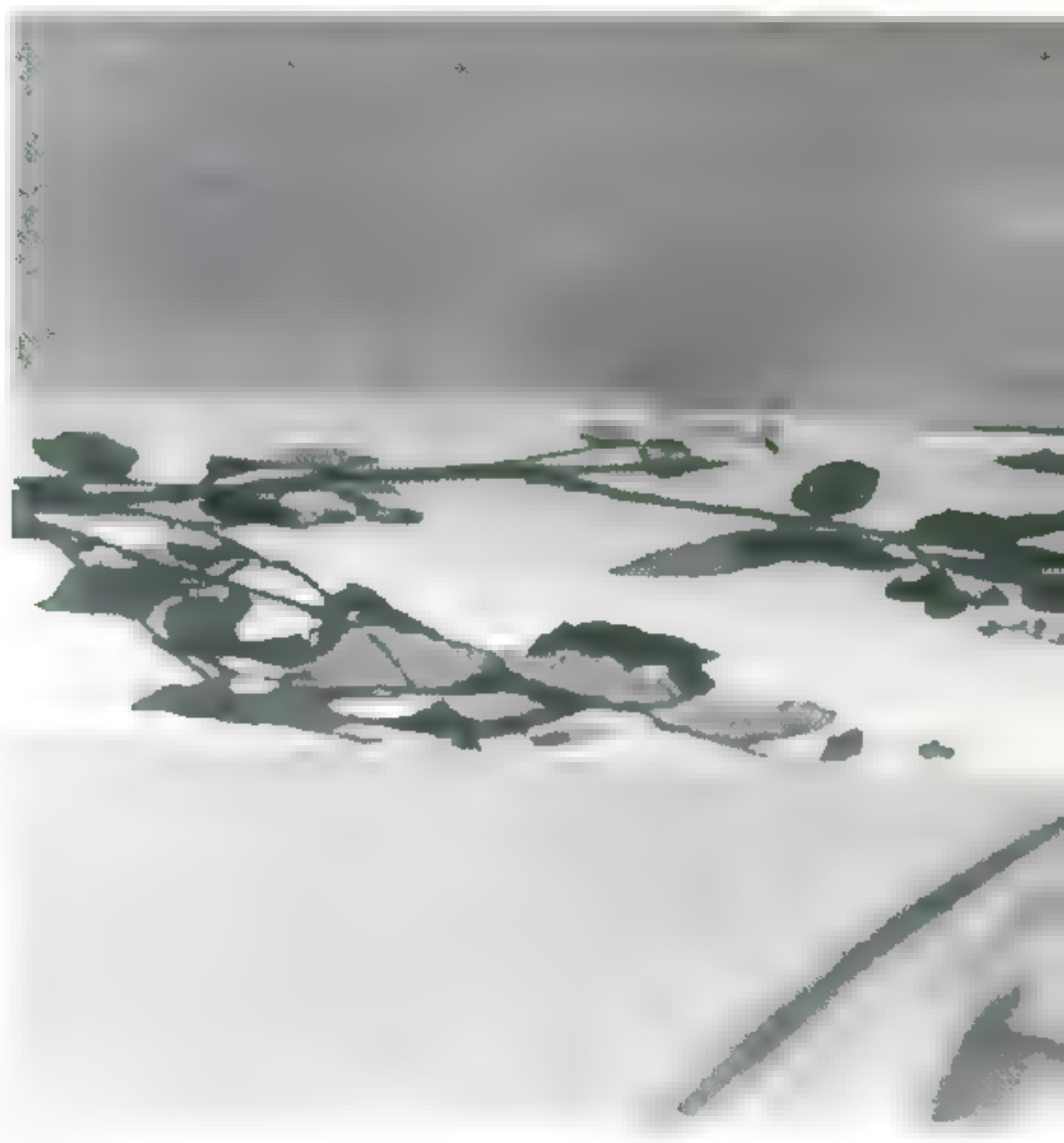
Open for luncheon Monday through Friday, 11:30 a.m. to 1 p.m., February through November, plus special Holiday Luncheons in December; advance reservations only. Call 577-5150.

Garden Walkers' Breakfast

7 to 10:30 a.m., every Wednesday and Saturday. Restaurant and grounds open early; free admission until noon. Sponsored by the American Heart Association. Call 577-5125 for information.

Special gift techniques not only create a lasting tribute, they can offer significant tax advantages as well.

◄ *A family gift that made possible the Brookings Interpretive Center on the Tropics included the Charitable Remainder Trust of Audrey F. Wallace*



▲ *Herbarium specimens been acquired through Testamentary Fund of Julian A. Steyermark*

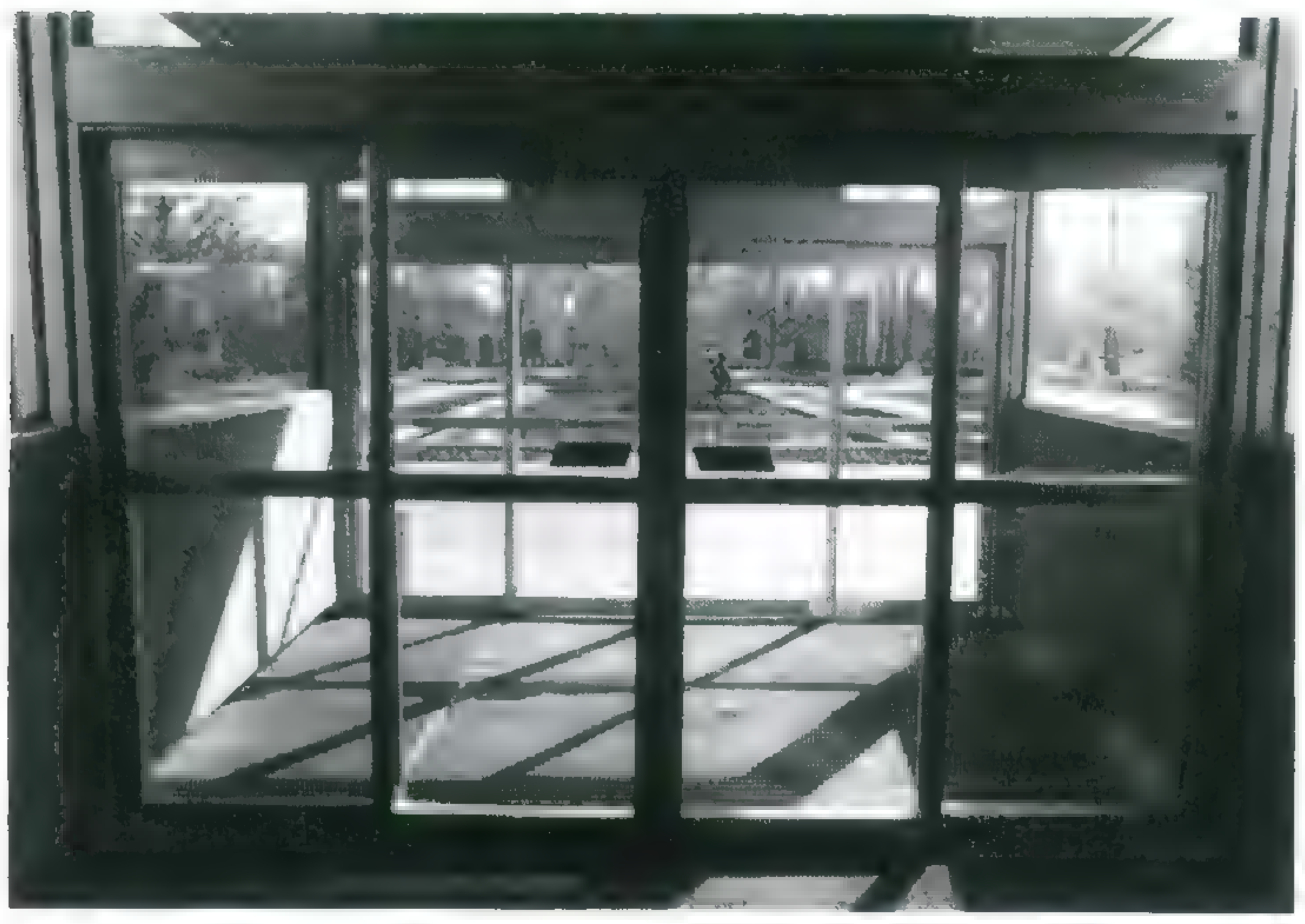
GIFT • PLANNING

A Lasting Memorial

Ever since Henry Shaw endowed the Missouri Botanical Garden in his Will, the Garden has grown and flourished through the thoughtful bequests of caring individuals. From features on the grounds and education programs that serve the community, to research efforts that benefit the world, planned gifts to the Garden create a wonderful living memorial.

As a service to its members, the Garden provides information on estate planning. To learn more about the opportunities available to you, attend the free Financial Planning Panel Discussion at the Spink Pavilion May 12, 1992, 9 a.m. to noon. Call 577-9532 for reservations.

Pitzman Nature Study Program, funded annually by the Testamentary Fund of Frederick Pitzman ▼



◄ *Renovation of the Climatron entrance, Bequest of Marion Graves in memory of Margaret Emilie Wright*

◄ *Azalea/Rhododendron Gard Bequest of Evvonne Huch*

▲ *Kaeser Memorial Maze, Bequest of Jennie Latzer Kaeser and other family contributions.*

Bequests to the Garde research program hel scientists to study an protect the biological diversity of the world plants, which may ho the keys to cures for cancer, AIDS, or worl hunger.

▲ *Pipe Bonsai Collection, B of Mr. and Mrs. Edward*

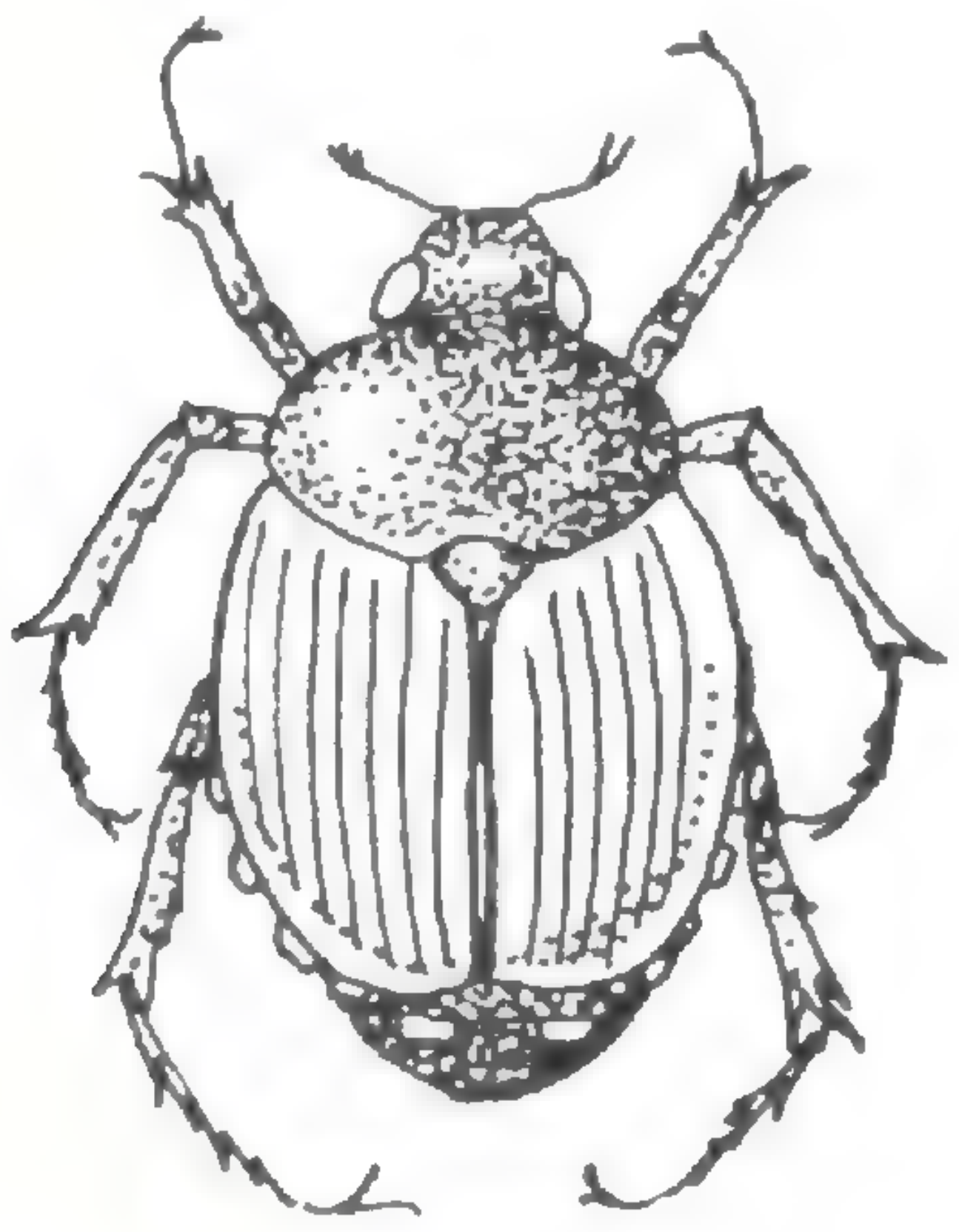
Support for the Garde education programs strengthens science education throughout St. Louis.

The beauty of the Garden's grounds and displays is a joy and delight to visitors.

Japanese Beetles

by Chip Tynan,
MBG Horticultural Answer Service

As though area gardeners didn't have enough insect pests to worry about, it appears that we now have the dubious honor of adding Japanese beetles (*Popillia japonica*) to our already impressive list of gardening foes. Handsomely colored, these ½ inch long beetles are a beautiful metallic green with coppery bronze wing covers and a fringe of white dots along the sides and tip of their abdomen.



Having arrived in America as stowaways in soils of plants imported from Japan, by 1916 a small population had become established in a nursery in Riverton, New Jersey. Since then, the beetles have spread and infested most of the Eastern United States.

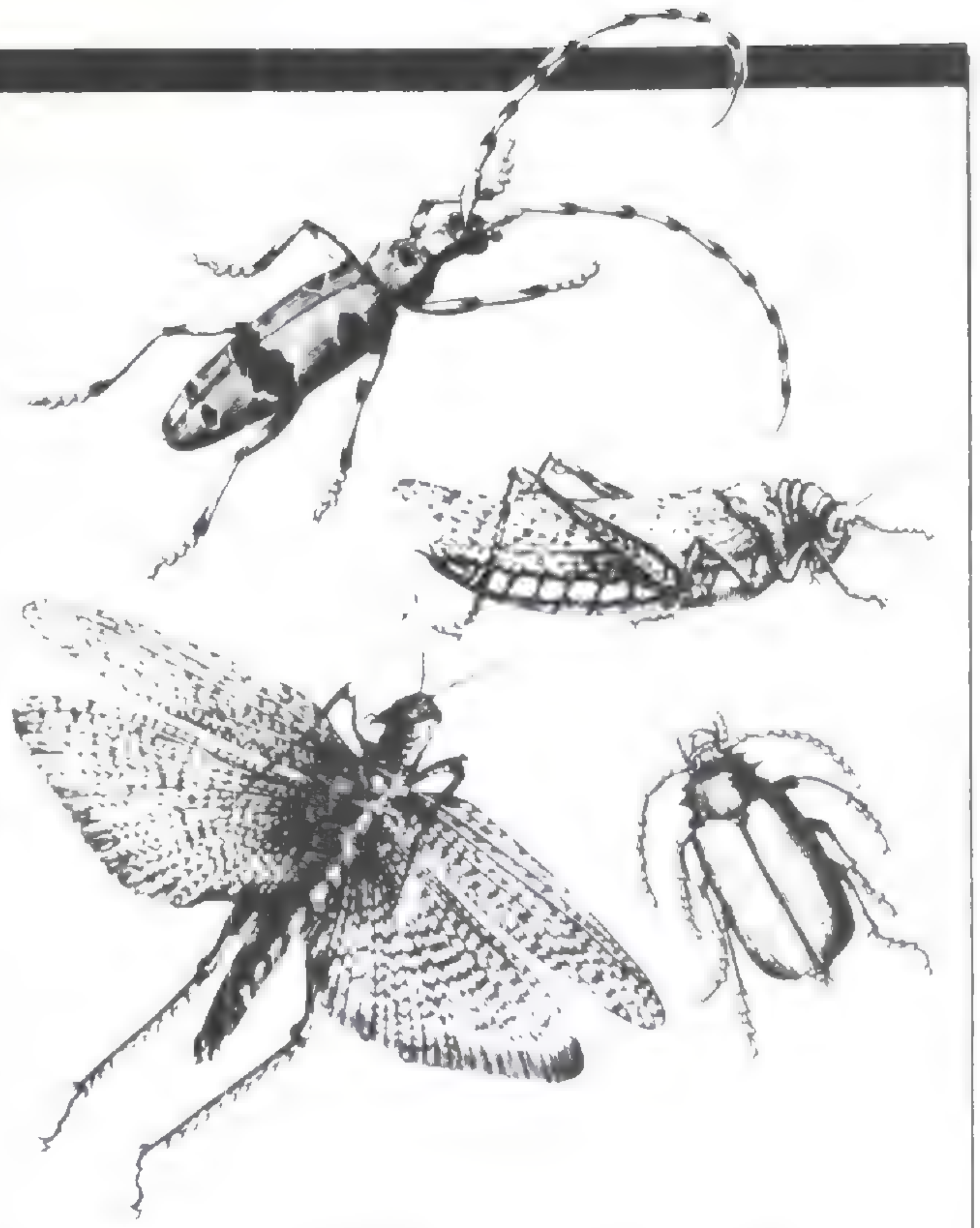
First discovered in St. Louis in 1934, with the exception of a few isolated "hot spots," Japanese beetles have never been numerous here until recently. Common as nearby as northern and eastern Illinois, their numbers are now increasing in the metropolitan area. Adults beetles begin to appear in late June and reach peak levels during July and August. By Labor Day, their numbers have dwindled sharply. Adults feed on approximately 300 species of plants, mostly deciduous fruits, shade trees, shrubs and garden flowers—especially roses. Few vegetables are eaten, though corn and soy beans may be attacked. Female Japanese beetles lay eggs throughout their active period, preferring grassy sites with sandy, loamy soils and abundant moisture. Golf courses and well-watered lawns make ideal habitats. The eggs hatch into a white grub that feeds on grass roots until cold weather sets in. In large concentrations these grubs can inflict serious injury to the roots of turfgrasses. In spring the mature grubs feed again for a short time, pupate, and then emerge as adults, completing their one year life cycle.

There is no one method that will provide complete control of Japanese beetles. Where only a few are encountered, hand picking is most effective. Japanese beetles are gregarious insects, preferring to feed among their own kind. Several traps are available commercially, utilizing either pheremones (sex hormones) or floral scents as attractants. These work so well, however, they may attract more beetles to your garden than would normally occur. Studies have shown that plants within 30 feet of beetle traps have suffered greater injury than plants not near traps. For this reason, it is advised to place traps well away from and downwind of any plants you are trying to protect.

The most vulnerable stage of development in the life cycle of the Japanese beetle is the newly hatched grubs. Their cycle roughly parallels the life cycle of the Southern Masked Chafer, or annual white grub, which is by far the most common white grub found in area lawn grasses. Therefore, any insecticide used to control the annual white grub, will also prove effective against Japanese beetle grubs. These insecticides are generally applied during the first two weeks in August. A biological control for Japanese beetles is milky spore disease. This naturally occurring bacterium is available under several trade names. It takes about three years to build up to effective levels in the soil but remains viable for years as long as there is a steady supply of infected grubs to serve as a host. It must be noted, however, that milky disease infects only Japanese beetles and does not control annual white grubs. A more recent biological innovation is the use of beneficial nematodes which prey on all white grub species. At the present time, however, these have not yet proven to be as effective as current chemical insecticides.

It is too early to predict how numerous and widespread the Japanese beetle will become throughout the region. Two things are certain however. They have arrived and are here to stay; and they are sure to have a detrimental impact on our gardens in the years to come.

Biological controls and traps for Japanese beetles are available in the Garden Gate Shop. Gardeners may bring live specimens or freshly trapped beetles to the Plant Doctor, Kemper Center for Home Gardening, for positive identification.



Enjoy a "Bug's Eye View" May 30 - August 23

9 a.m. to 8 p.m. daily, Brookings Interpretive Center. Experience a thrilling exhibit where the world is seen from an insect's point of view. Huge leaves, flowers, and insects create a wondrous environment that will enhance your understanding of the Earth's most diverse and successful life form. Insects have survived for 300 million years, number 30 million species, and have affected every aspect of life on our planet.

Learn why spiders, millipedes, ticks, sow bugs and centipedes are not classified as insects. Make your own insects by working with an assortment of different legs, body parts, antennae and wings, test a pair insect wings, take a robotic insect for a walk, build a beehive, design a butterfly wing and discover new strategies for keeping harmful insects under control.

Special events include:

June 10, 17 and 24: Children's Tours

A fun look at the world of insects. Tours leave from the Ridgway Center lobby at 9:30 a.m., 11 a.m. and 12:45 p.m.

June 16: Pollination Pals

10:30 a.m. Children ages 9-11 will learn how plants and insects have formed an interdependency that keeps the Earth green and growing. Children will make a pollination model to take home and visit the Bug's Eye View exhibit. Reservations are required, $1.50 per child. Call 577-5125 beginning June 1, 1992.

"Bugs Eye View" is jointly sponsored by the St. Louis Science Center, Zoo, and the Garden. The exhibit is part of the second National Science Foundation sponsored Exhibit Research Collaborative and was designed by the Oregon Museum of Science and Industry. Free with Garden admission.

From the Membership Office

It's Purple Martin Time Again

Ashley Gray sprucing up the purple martin houses.

On May 13 Garden members can spend a delightful evening with the Garden's Purple Martin Curator, W. Ashley Gray III, and learn how to attract America's most wanted bird to your own yard.

Purple martins feed only on flying insects including mosquitoes, flies, and other pests. The birds are graceful in flight and demonstrate interesting behavior traits. They are a semi-domesticated species that prefers to live near human activity and if nesting conditions are proper they will return to the same nesting place year after year.

Join us at 6:30 p.m. for one of the Garden's most popular annual celebrations.

Garden Hosts Film to Benefit Seacology Foundation

May 7, 1992 at 5:30 p.m. the Garden will host the American premiere of the film "Nafanua: Saving the Samoan Rainforest" to benefit the Seacology Foundation. The benefit premiere includes a cocktail reception before the film is shown at 6:30 p.m., and it will be followed by a discussion with Bo Landin, the film's producer, and Dr. Paul Alan Cox, founder of Seacology.

Tickets for the benefit are $30 per person, and the proceeds go to the Seacology Foundation. Reservations may be made by calling (314) 577-9500. (See the Calendar of Events, page 10-11.)

The Seacology Foundation was formed with the mission of preserving the rain forests, coral reefs and ancient cultures of Polynesia. To accomplish this, Seacology works with the indigenous villages, building needed schools, hospitals and water supplies. In return, the villages form rain forest and marine reserves which they control, manage and protect.

Fluent in Polynesian languages, Seacology scientists have been instrumental in protecting over 65,000 acres of rain forest, by building three schools and one hospital. "Nafanua: Saving the Samoan Rainforest" is a joint production of Scandinature Films (Sweden), ITV-4 (England), and the Australian Broadcasting Corporation. The film shows the creation of the first of these reserves in Falealupo village, Western Samoa.

Reciprocal Garden Memberships

When planning your summer vacation, consider visiting the Fairchild Tropical Garden in Miami, Florida, and any one of 57 other botanical gardens and arboreta throughout the country. You will receive free admission and special privileges, just as their members do when visiting the Garden. Call the Membership Office at 577-5118 for eligible gardens in your vacation area.

"Bouquets to Mom"

Luncheon in honor of
Mother's Day, Friday, May 8.
Reservations are $35 per person
for members and $45 per person
for non-members.
See the invitation mailed recently
to all members, or call 577-9500.

Marching Flowers Debut in May Parades

The Missouri Botanical Garden Marching Flowers will participate in the Annie Malone Parade beginning at 1:00 p.m. on Saturday, May 16, and in Shaw's Together-Fest Parade in the Shaw neighborhood area beginning at 11:00 a.m. on May 30.

We want to take this opportunity to express our sincere gratitude to the dance group Rhythm Review U.S.A. and their director, Gerri Stretz. The group will perform as the Garden Marching Flowers in 1992 parades.

Moving? Please Remember To Send Us Your New Address.

To avoid missing any of your membership mailings, you *must* give us your new address at least three weeks *before* you move. Please enclose the mailing label on the back cover of this *Bulletin*, and mail to: Membership Office, Missouri Botanical Garden, P.O. Box 299, St. Louis, MO 63166.

Name:________________________

Old Address:

____

City__________________________

State____________Zip____________

New Address: (Date effective:__________)

____

City__________________________

State____________Zip____________

The Remarkable Neem Tree

THIS time of year, we often can predict the inquiries that will come to us over the phone or from visitors to the Garden. Are the tulips and rhododendrons in bloom yet? Should I protect my plants tonight? Were the magnolias damaged by the freeze? This spring, another question has been just as common: Have you heard of the neem tree, and does the Garden have one?

The neem tree, *Azadirachta indica*, is originally from India and Burma, but was exported to other parts of Asia and to Africa long ago because it was known to be a remarkably useful plant. Recently, interest was fueled by the release of a report on neem from a study sponsored by The National Academy of Science. In that report, neem was described as "a tree for solving global problems." One national news magazine termed the furor over the neem tree as "Neemania."

By studying neem, the modern scientific community is taking a cue from the knowledge that people have accumulated and utilized for centuries. In India, dried leaves from the neem tree have been placed in cupboards and drawers to repel roaches, moths, and other insects. African tribes know that smoke from burning neem wood will deter biting insects. Workers in this century observed plagues of locusts obliterating and devouring everything in their path—except neem trees! Perhaps the same observation was made hundreds of years ago, and led to the use of neem as an insecticide. Modern researchers have isolated compounds from neem leaves and fruit that disrupt growth of some insects, or that prevent other insects from feeding. And even more important, while neem extracts can be toxic to some pests, most other organisms appear not to be affected.

Many people in India have excellent teeth and gums, although they have no access to modern dental care. They claim that neem is responsible; for generations, twigs from neem have been chewed. Laboratory experiments show that neem bark contains antiseptic extracts which destroy bacteria, the main cause of tooth decay. Other compounds found in neem hold promise as birth control drugs as well as for anti-inflammatory and blood pressure medications.

So, why the sudden fuss over a tree that has been known for centuries to contain useful natural compounds? Professor Eugene Schultz of Washington University, who headed the panel reporting on neem, explained that the excitement is due to the unusually large number of compounds found in neem, and in the range of their uses. Also, many of the compounds appear not to be extremely toxic. Neem has other advantages, as well. It is a fast-growing tree of the mahogany family (Meliaceae), and is able to withstand dry conditions. In some parts of Africa, the plant is used for soil stabilization and much-needed firewood. Needless to say, research labs and chemical companies all over the world are suddenly quite interested in neem.

Modern scientists are taking a cue from knowledge people have accumulated and utilized for centuries.

Of course, many plants have compounds that can be used by humans. The first medical doctors were herbalists, and native peoples from all over the world have practiced folk medicine through their knowledge of plants. Approximately one quarter of all prescriptions written in the United States contain at least one plant-derived product. Aspirin, or salicylic acid, was first discovered in the bark of the willow tree (Salix) but is now synthesized in a laboratory. The commonly cultivated rosy periwinkle is the source of two important drugs that are now successfully fighting childhood leukemia and Hodgkin's Disease. Both cortisone and birth control drugs were first derived from a wild yam.

Is neem the tree to solve global problems? Only time and a great deal of research and development will tell if the compounds from neem are as consistently effective and as safe as they appear to be. How many other wonder plants hold important agents for curing disease, improving health, and providing more effective and safer agricultural practices? At this moment, the human race is in danger of loosing two of our most valuable possessions for our future: Plant species diversity and the accumulated knowledge of indigenous peoples all over the world.

And, before I forget—Yes, we do have a neem tree. Look for it in the Climatron on your next visit.

—Lucile McCook, Ph.D.
Horticultural Taxonomist

Garden Explorer Patch Program

Parents looking for a new and different activity for children ages 6 to 18 may wish to consider the Garden Explorer Patch Program at the Garden.

This focused field trip seeks to make children enthusiastic, lifelong visitors of the Garden by exposing them to some of the more outstanding features of this world renowned cultural institution. Children who complete a series of interactive tasks during the course of a visit to the Garden receive a triangular cloth patch.

All children who earn the patch must be led by an adult who has been trained in a workshop prior to the visit to the Garden. Costs for the activity are minimal. The patch is $1.50. Workshops are $3.50 for the first, $1.00 for succeeding ones.

For additional information about the program, call Pam Pirio, Education Division, 577-9501.

Henk van der Werff in his office at the Garden.

P·R·O·F·I·L·E

Henk van der Werff, Ph.D.

ONE of the world's most important tropical plant families, Lauraceae, happens to be one that many botanists shun. Dr. Henk van der Werff, associate curator and head of the department of Neotropical Taxonomy at the Garden, is one of only a handful of botanists worldwide who are experts in this family of trees, and the leading expert on the neotropical Lauraceae. "It has a reputation for being an unpleasant family," explains van der Werff. "The trees are very tall and the flowers inconspicuous, and herbarium collections are poor. Yet it's a very important component of wet tropical forests. I find it very interesting."

Van der Werff received his Ph.D. in 1978 from the State University of Utrecht in The Netherlands, his native country. When he came to the Garden in 1982 he decided to switch from the study of ferns to Lauraceae, at the suggestion of Peter Raven, director of the Garden. "The family was so poorly known and so important that from an institutional standpoint Dr. Raven felt the Garden should have a Lauraceae specialist. I'm glad he gave me the encouragement and the freedom to learn all I can about it," says van der Werff.

The Lauraceae family includes such economically important plants as avocados; cinnamon, bay leaves, camphor, and other spices; plants, such as rosewood, whose aromatic oils are used in perfumes and soaps; and hardwood trees used for construction and furniture making.

Van der Werff is contributing greatly to the body of knowledge about Lauraceae with a project he has begun with botanist Bernie Hyland of Australia to examine the relationships between genera of Lauraceae worldwide. Because good collections are scarce and the choice of characters used to recognize genera is poor, the genera of the family are not well defined. This worldwide study of the relationships among the genera, which should take several years, will give botanists a definitive classification of the family.

But van der Werff doesn't spend all his time on his botanical research. He wears two very important administrative hats at the Garden as well. Earlier this year he was appointed head of the newly organized Department of Neotropical Taxonomy within the Division of Research, supervising the curators who work primarily on revisions and monographs. In 1991 he was named editor of the *Annals of the Missouri Botanical Garden*, the Garden's scholarly quarterly journal. "The *Annals* is one of the best botanical journals in the United States, and I'm very honored to have been named editor," he says. His success as editor is all the more impressive given that English is not van der Werff's native language.

When asked to reflect on his 10 years at the Garden, van der Werff is very complimentary of the Garden's research staff members. "The Garden is a very nice place to work because of the atmosphere of collaboration and support among its staff members," he says. "The Garden provides its scientists tremendous freedom to work, which fosters a very pleasant work environment."

MBG Videos Are A Hit!

With more than 5,000 sets sold to schools throughout the United States, the Garden's educational videos are a hit with students and teachers alike. The videos, developed by Herb Halpern Productions in cooperation with the Garden's education division, teach topics in natural sciences to elementary school children.

The first series of six videos on habitats and ecological topics has been available for just over a year. This spring a second set of six videos is in production and will be available this summer. The new series focuses on the biology of plants, featuring "Life Cycles," including seed germination, growth, and flowering; "Structure and Function," or the roles of roots, stems and leaves; "Pollination;" "Seeds on the Move," the various methods of seed dispersal; "Plant Adaptations," the specific ways desert and rain forest plants survive; and "The Role of Plants in the Ecosystem," a synthesis of topics from both series of videos.

A teacher from Alaska writes, "The tapes enhanced what we had been studying. They are clear, with a good scientific approach, a wonderful review, and they are fun!" Students write, "I like them because I learned something," "They are neat" and "the tape is interesting!"

For more information on the videos or to order, call 1-800-927-9229.

MBG Will Train Master Gardeners

The Missouri Botanical Garden and the University of Missouri Extension are seeking experienced gardeners to participate in the Master Gardener volunteer program.

Program volunteers are trained to take part in gardening education programs including diagnosing gardening problems, giving gardening lectures, and organizing "growing" experiences for area school children and older adults.

Candidates must be experienced gardeners able to volunteer at least one day a week on a regular basis. For additional information and to receive an application form, call the Garden at (314) 577-5140. Training will begin in October 1992 and run for 15 weeks. Application forms must be received by Friday, June 26.

THIS SPRING AT SHAW ARBORETUM

Expanded Woodland Burning

VISITORS to the Shaw Arboretum during the spring of 1991 may have noticed, with surprise, several burned areas in the woods, in addition to the usual prairie burns. In 1992, even more acreage of woodland was burned, in some cases by simply allowing prairie burns to proceed through the woods to preexisting fire breaks such as Brush Creek or the Loop Road through the Preserve. This lessens the amount of staff time necessary to prepare arbitrary fire breaks, an advantage in itself, but also has interesting and beneficial ecological effects.

Previous to the arrival of European settlers to the midwest, the resident Native Americans set carefully timed fires to fields and prairies in the fall to late winter. The set fires reduced the danger of wildfires near their villages and opened up the vistas to enable them to spot game or see arriving friends or foes. It also had profound effects on the vegetation. People today are generally familiar with the openness of the sweeping midwestern grasslands, but it is less well known that the woodlands of the area were much more open than is typical today. As a result of periodic fires, trees grew isolated or in clumps,with sunny spaces populated by prairie grasses and flowers between them. Dense, shady forests of the sort we consider typical everywhere in Missouri today, occurred only in the moist valleys and river bottoms a little over a century ago.

By allowing the prairie fires to extend into the woods, the Arboretum staff hopes to recapture in a small way the character of the presettlement vegetation of Missouri. As a result of years of fire suppression, there has been a large accumulation of burnable material in the woods. The first few woodland burns should consume most of this excess fuel. As the program of burning continues, experience in other eastern Missouri natural areas shows that in some years, the fuel loads will be too low or too wet in the shadier areas for the fire to continue into the woods from the prairie. In this way (even in the midst of the annually burned prairie), nature itself maintains the woodlands, which would eventually disappear if they burned every year.

Another advantage of periodic woodland burning is the killing or at least partial control of invading woody species. The nonnative privet and honeysuckle bushes aggressively invade the Arboretum woodlands, shading out the native wildflowers and even preventing the regeneration of the native oak and hickory trees. Even some native plants such as elms, sugar maples and red cedars may invade the unburned woods and shade out the characteristic species of the fire-adapted woodlands. In a curious twist, this ''natural'' succession leads to a loss of biodiversity right in our own backyard, where we can most easily prevent it!

—James C. Trager, Arboretum Naturalist

James Trager supervises a controlled burn at the Arboretum.

"Growing Vegetables and Cultivating Friends"

If the Gateway to Gardening Association (GTGA) needed a motto, this might do. The primary goal of the volunteer group is to encourage community vegetable gardens in St. Louis, but an important side benefit is the good feeling that GTGA ignites among gardening neighbors as well as for the GTGA itself.

The Gateway to Gardening Association was founded in 1984, a not-for-profit organization that would provide leadership, education and assistance in creating community and school vegetable gardens. At least 47 community gardens and 16 school projects in north and south St. Louis will be producing food this spring.

The Missouri Botanical Garden is an enthusiastic partner of the GTGA, providing Garden-trained Master Gardeners to advise the growers and a site for an annual Urban Gardening Fair, among other services.

In the early years the GTGA volunteers worked out of their homes, under the direction of Kitty Hoblitzelle, but the success of the program led to the hiring of a full-time director, Michael Adrio, in March 1991. The GTGA budget was increased from $25,000 to $93,000 as requests for gardening assistance multiplied.

Last fall the favorable impact made by GTGA volunteers was recognized by the St. Louis Board of Alderman and as result the Community Development Agency awarded GTGA a block grant of $22,000 for neighborhood betterment. Substantial additional help was sought from corporate, foundation and government sources. Among the major contributors were the Monsanto Agricultural Co. and the William T. Kemper Foundation.

The check was presented at a party hosted at the Garden in February. Pictured are (from left): John Dill, Mosby-YearBook; Rich Block, World Wildlife Fund; Peter Raven; George Johnson.

World Wildlife Fund Recevies $35,045 Gift from Raven and Johnson

Dr. Peter H. Raven and Dr. George Johnson have presented a check for $35,045 to the World Wildlife Fund, representing a portion of the royalties from sales of *Understanding Biology*, Edition 2, published by Mosby-Year Book, Inc. of St. Louis. Raven and Johnson are co-authors of *Understanding Biology.* The Mosby text is used extensively by biology students in colleges and universities all across the nation.

"The World Wildlife Fund actively pursues conservation measures in the United States and throughout the globe," said Raven. "I am delighted that each student purchasing this text contributes to bettering our world while using the text to better understand our environment."

Rueda and Gentry Receive NSF Grant

Ricardo Rueda, a graduate student at the Garden and his advisor Dr. Alwyn H. Gentry have been awarded a $9,550 grant from the National Science Foundation. Rueda is a doctoral candidate in the joint program of the Garden and the University of Missouri-St. Louis, where he was named the first Peter H. Raven Fellow.

Rueda has completed his M.S. degree on the genus *Clerodendrum* and now is studying the genus *Petrea*, both in the Verbena family. He will use the NSF grant for a trip to the Amazon region of Brazil. Upon his return he will complete his doctoral thesis and then return to the Universidad Nacional Autonoma de Nicaragua-Leon, where he has been a professor since 1983.

From the Garden Gate Shop

Book Review

Sustainable Harvest and Marketing of Rain Forest Products

Edited by Mark Plotkin and Lisa Famolare, Conservation International, 320 pages, available mid-June 1992, $20 paperback, $40 hardcover.

Based on a June 1991 Conservation International conference in Panama that involved scientists, indigenous peoples, and business leaders, this book brings together the world's leading experts on rain forest development and sustainability, including Richard Schultes, Harvard Botanical Museum; Alwyn Gentry, Missouri Botanical Garden; and Gary Nabhan, University of Arizona and Native Seed Search. The authors present alternatives that are technically feasible, financially attractive, and— most important— compatible with the often competing goals of ecosystem conservation, cultural survival, and community development.

Mark Plotkin is vice president for the program in plant conservation, and Lisa Famolare is a program associate at Conservation International, an organization dedicated to the conservation of ecosystems and biological diversity worldwide.

Don't Forget!

This year Mother's Day Is May 20, and Father's Day Is June 21. Get the perfect gift for your special someone at the Garden Gate Shop. Choose from the wide array of gifts, books, jewelry, stationery, gardening tools, and flowering plants. Gift certificates are available.

The Subject Is Roses

Especially in honor of Rose Evening, May 29, the Shop will feature a marvelous selection of gift items on the theme of our favorite flowers. You are invited to the premiere of "La Rose de Beauté," a very special package especially for the Garden by Nicole Beaute, New York. This lovely perfume is a blend of roses from Morocco and France, available in a 1.5 ml. vial with a charming sachet, for $7.50.

CPC Science Advisory Council Holds Annual Meeting

Science Advisory Council members (from left) Robert A. DeFilipps, Ph.D., Smithsonian Institution; Robert Mohlenbrook, Ph.D., Southern Illinois University; Norton Nickerson, Ph.D., Tufts University; Christopher Topik, Ph.D., U.S. Forest Service; Barbara A. Schaal, Ph.D., Washington University; Richard W. Lighty, Ph.D., Mt. Cuba Center for the Study of Piedmont Flora; and Larry E. Morse, Ph.D., The Nature Conservancy.

The Center for Plant Conservation's Science Advisory Council (SAC) held its annual meeting February 9-10 at the Missouri Botanical Garden.

The SAC consists of a distinguished group of plant scientists who are committed to ensuring that, consistent with current research and conservation biology practice, the Center's programs meet the highest scientific and technical standards.

At the meeting, the SAC reviewed 107 accession proposals and approved 57 new taxa to be brought into the Center's National Collection during 1992. The new taxa will bring the National Collection to a total of 450 species.

Other items discussed include the criteria for the inclusion of new taxa into the Collection, criteria for the inclusion of new institutions into the network of Participating Institutions, uses of the National Collection and the procedures for revising the 1988 Endangerment Survey.

The SAC also elected Barbara A. Schaal, Ph.D., professor of botany at Washington University, as chairperson of the SAC. She succeeds John J. Fay, Ph.D. of the U.S. Fish and Wildlife Service.

Dr. Schaal was previously a professor of biology at Washington University and is a research associate at the Missouri Botanical Garden.

In addition, the SAC recommended a candidate to receive the Catherine H. Beattie Fellowship. The Fellowship is awarded annually by The Garden Club of America to a graduate fellow recommended by the CPC. The Fellowship funds research that contributes to the discovery and understanding of endangered plants of the southeastern United States.

NEWS FROM THE GARDEN LIBRARY

A Complete Collection

The Missouri Botanical Garden Library is widely recognized as having one of the world's most complete collections of taxonomic and floristic literature. The Garden library now has the opportunity to further enrich its already outstanding collections by filling in titles that are not in the collection with copies from the Inter Documentation Company (IDC) Microfiche Collection.

With the assistance of Frans Stafleu, a world renowned botanist, IDC chose 6,156 titles of major botanical works and placed them into the microfiche format. Of these 6,156 titles, the Garden library already has at least eighty-five percent that are wanted. The other fifteen percent, or 952 titles, will be purchased, thereby giving the collection even greater strength. The titles will be purchased from IDC at half-price in return for cataloging them into OCLC, an international database that contains more than 23 million records and is used for cataloging by more than 12 thousand libraries.

Friends or members of the Garden who are interested in helping to support the cost of acquiring the IDC collection may call Constance Wolf, Missouri Botanical Garden Librarian, at 577-5156.

Linda Oestry Joins Library Staff

On March 2, 1992, Linda Oestry began work as the Garden's Curator/Bibliographer of Botanical Literature. She is responsible for managing the library's acquisitions program, as well as providing reference services to library users. Linda received her M.S. in Botany from the University of Illinois, Urbana, in 1976. She currently is a Ph.D. candidate in biology.

Linda Oestry

MISSOURI BOTANICAL GARDEN ARCHIVES

Robert Hyland (left), 1988 St. Louis Man of the Year, presents the 1989 award to Peter Raven.

Robert F. Hyland, Jr.

The Garden and St. Louis lost a longtime friend with the death of Robert Hyland on March 5, 1992. Mr. Hyland, who was 71, was senior vice president of CBS Radio and general manager of the network-owned KMOX, which he joined in 1951. A native St. Louisan, he was a leader in St. Louis civic, philanthropic and business affairs throughout his career and was named 1988 St. Louis Man of the Year.

In 1983 Mr. Hyland was awarded the Garden's Henry Shaw Medal for his contributions to the St. Louis community, most especially for his work as chairman of the successful Zoo-Museum District campaign earlier that year. As a result of that campaign the Garden now receives direct tax support, for the first time in its history.

Dr. Raven said, ''Robert Hyland gave extraordinary leadership to St. Louis and to its cultural institutions, and we are grateful for his friendship and his legacy.''

Marguerite Ross Barnett

Dr. Marguerite Ross Barnett, former chancellor of the University of Missouri-St. Louis 1986-90, died of complications of cancer on February 26, 1992. She was 49.

Dr. Barnett was the first chancellor of UM-St. Louis to be named to the Garden's Board of Trustees. She played a major role in establishing the joint Ph.D. program in biology with the Garden and UM-St. Louis in 1989 and established the Peter H. Raven Fellowship in Tropical Botany in honor of the Garden's director.

Peter Raven said, ''Dr. Barnett was a marvelous person, one of the most effective and appreciated African-American leaders in St. Louis history. It is tragic that such a talented person would die so young. She made a lasting contribution to education and to the Garden, and we are grateful that we had the opportunity to work with her and benefit from her energy and counsel.''

Dr. Blanche M. Touhill, who was named chancellor of UM-St. Louis following Barnett and who is currently a Garden Trustee, said, ''As the fifth chancellor of the University of Missouri-St. Louis, Dr. Barnett made outstanding contributions to the vitality and development of this campus. These remain her lasting legacy to our campus and our city. In addition to her distinguished record as an educator, Dr. Barnett was an internationally recognized scholar, the author of much admired books and essays in the political science of developing nations and American higher education issues. The death so young of any friend brings great sorrow, and our sadness is deepened at the loss of a friend and colleague of such talents, accomplishments, and virtually boundless potential for continued achievement.''

C. Peter Magrath, president of the National Association of State Universities and Land-Grant Colleges, said, ''Marguerite was a person of exceptional integrity, intelligence and imagination. Her leadership, vision and extraordinary insights into the role that public higher education fulfills in our society will be sorely missed by all of us. I am tremendously saddened by the loss of a good friend.''

At the time of her death Dr. Barnett was president of the University of Houston. Before joining UM-St. Louis she was vice chancellor for academic affairs at City University of New York.

In her memory, UM-St. Louis has established the Marguerite Ross Barnett Fund to help endow a professorship or scholarship. Contributions may be sent to the Office of University Relations, 426 Woods Hall, 8001 Natural Bridge Road, St. Louis, MO 63121-4499.

Behind the Scenes

Wilkerson Named President Elect of HRMA

The Human Resource Management Association of Greater St. Louis (HRMA) has elected Sue L. Wilkerson, the Garden's director of Human Resource Management, as president elect for 1991-92.

HRMA is a nationally-affiliated society of professionals in personnel management. Wilkerson has been affiliated with HRMA for 12 years and wrote the first strategic plan ever developed for the organization. With 350 members, HRMA is the largest human resources organization in St. Louis, with members from both the corporate and non-profit sectors.

In her work at the Garden, Ms. Wilkerson has provided strong leadership in developing the Cultural Diversity Committee and in responding to the complex needs of the 345 person staff. ''The Garden is at the forefront of innovation in dealing with today's workplace in such matters as health care, family and personal issues, sexual harassment and cultural diversity,'' said Dr. Peter H. Raven, director. ''We are very proud of Sue and the direction she so ably provides in making the Garden a model employer.''

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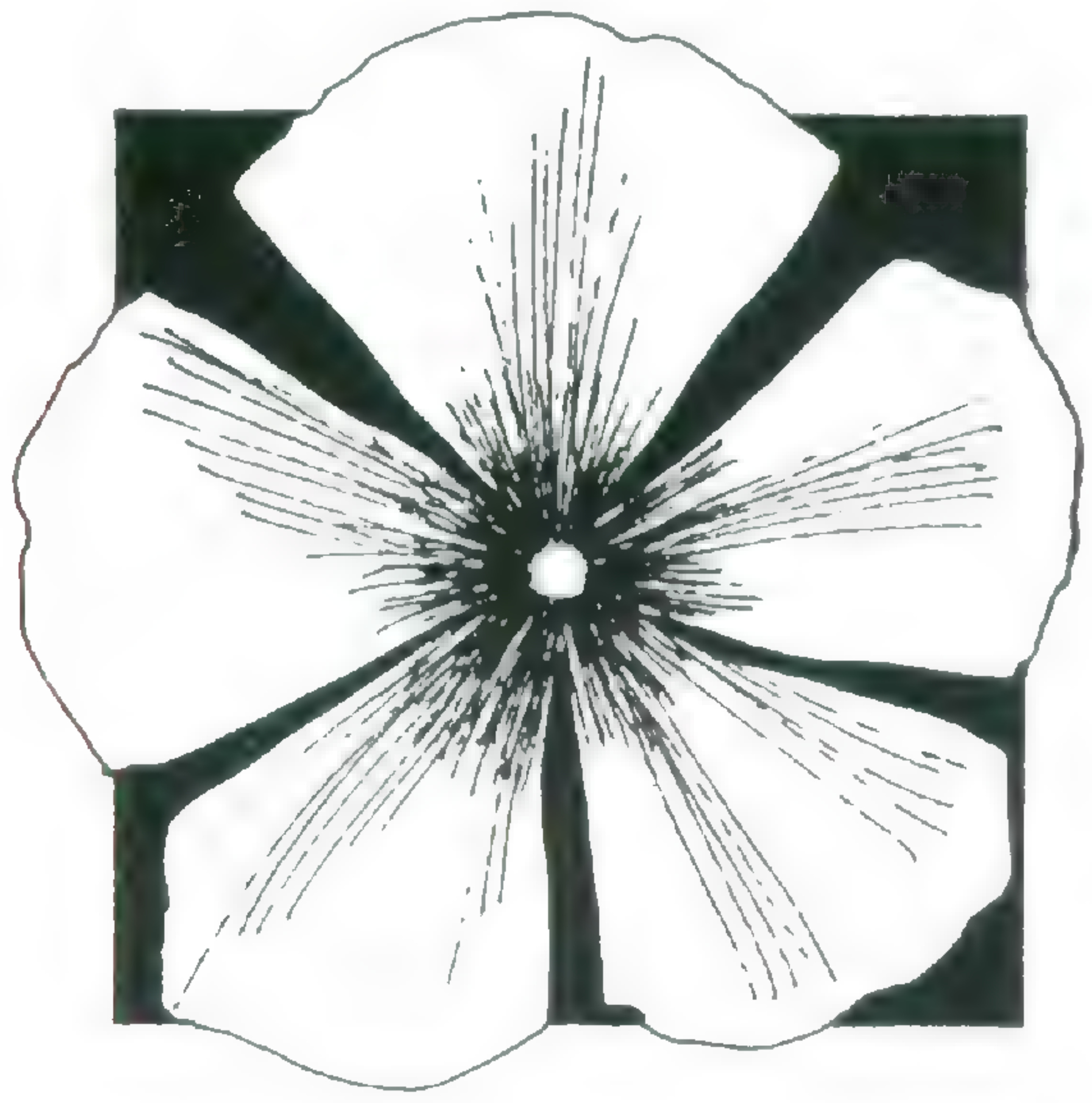

Rosy Periwinkle Celebration

Watch for more details on this salute to the Rosy Periwinkle, the plant source for the cure for childhood leukemia and Hodgkin's Disease.

Join us for a day of activities and events that focus on the Rosy Periwinkle and the role plants play in providing modern medicines. From collection by botanists to studies and manufacture by pharmaceutical companies to use by doctors and their patients, you will gain a deeper appreciation of the uses of plants.

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On the cover: The Shapleigh fountain delights visitors of all ages on hot summer days.
—Photo by King Schoenfeld

1992 Missouri Botanical Garden.

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Comment

Summer Celebrations

Japanese, Greek, Native American, and Italian traditions will be featured in the second Festival of Festivals throughout August (see the back cover). The Garden has coordinated these focused weekends with local organizations and we wish to extend our appreciation to them for their efforts. The St. Louis Japanese Chamber of Commerce, Japan America Society, Japanese American Citizens' League, Japanese Language School of St. Louis, Japan Society, Suwa Sister City Committee, and the Consul General of Japan-Kansas City are key to the success of the Japanese Festival. Assumption Greek Orthodox Church has been instrumental in assisting with the Greek Festival, as has the Cahokia Mounds Historical Site and the American Indian Center of Mid-America Inc. in planning and organizing the Native American Festival. The concluding Italian Festival has received significant support from the Civic Italian American Organization (CIAO) and we are most grateful for their sponsorship. Due to limited financial resources, it was essential to work cooperatively in planning and funding these festivals and the magnificent involvement and support from community organizations is gratefully recognized.

We offer our personal welcome to the Tebeau Family, who became the Garden's 30,000th members in May of this year, and we are delighted with the growth in membership that has been evident at the Garden for the past several years.

Finally, the Earth Summit in Rio de Janeiro this past month heightened public awareness about the environment and the meaning and importance of biodiversity, a topic the Garden has pursued vigorously for the past several years. Your continued interest and commitment provides the necessary backing for us to pursue efforts in furthering the understanding of biodiversity through our botanical research and environmental education programs. Increased understanding and awareness of biodiversity is vitally important to our future. Your involvement as a Member ensures our joint progress toward this goal.

Thank you.

Peter H Raven

CLIFF WILLIS

NEW CONSERVATION CENTER UNDERWAY—Interior demolition has begun on the Park Building, the first phase in renovating and expanding that structure to create the Conservation Center. The expanded Center will house the division of horticulture, the staff of the Center for Plant Conservation, the Horticultural Answer Service, the Gateway to Gardening Association of St. Louis, and space for Garden staff to work internationally with colleagues dedicated to conservation through horticulture and environmental education. A $500,000 challenge grant from The Kresge Foundation has stimulated donor support at a level permitting project completion by Spring 1993.

KEVIN GRACE

Shown with the horse drawn carriage in front of Tower Grove House are (from left): Tony Longrais, Mary Longrais, Christopher Tebeau, Lois Tebeau, and Ralph Tebeau.

Garden Welcomes Its 30,000th Member!

On Saturday, May 23, 1992, the Garden officially announced that its membership had reached 30,000 families, one of the largest memberships of any cultural institution in St. Louis and of any botanical garden in the nation.

The 30,000th member family, Mr. and Mrs. Ralph Tebeau of South St. Louis County, were welcomed at a celebration at the Garden. The Tebeaus and their son Christopher enjoyed a ride through the grounds in a horse drawn carriage, followed by luncheon outside at Tower Grove House with Mary Longrais, president of the Garden's Members' Board, her husband Tony, Garden director Peter H. Raven and Mrs. Raven.

The Garden's membership program began in 1939 and celebrated its 50th Anniversary in 1989. In 1971 the membership numbered about 2,000, and reached 20,000 in April, 1987. It has increased to 30,000 in just five years.

"The enthusiasm of our members and their unwavering support make all the difference to the Garden," Raven said. "As we seek to serve the needs of the entire St. Louis community we are delighted to welcome new members who help us to meet those goals."

MISSOURI BOTANICAL
JUL 01 1992
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NEW CURATORSHIPS HONOR LEHMANNS

Davidse and Morin Are Named Lehmann Curators

Gerrit Davidse with "Corn and Millet" by Bertuch of Germany, printed 1792-1802, an original hand-colored copper engraving which was presented to him at the ceremony.

CLIFF WILLIS

Nancy Morin with a print of Iris douglasiana ***by Henry Evans which was presented to her at the ceremony.***

AT a ceremony on April 9, 1992, Dr. Gerrit Davidse was named John S. Lehmann Curator of Grasses, and Dr. Nancy Morin was named Anne L. Lehmann Curator of North American Botany at the Garden.

Dr. Davidse is an expert in the Poaceae, or grass family, particularly tropical American grasses. He is co-organizer of the international *Flora Mesoamericana* project. This long-term, collaborative project, a description of the plants growing from southern Mexico to Panama, is the first major regional flora ever written in Spanish. It is being conducted in cooperation with the National Autonomous University of Mexico and the Natural History Museum in London.

Dr. Morin is an expert on North American Campanulaceae, the bellflower family. She is head of the Garden's department of Botanical Information Management and serves as the convening editor of the collaborative, international *Flora of North America* project, the first formal cataloging of the plants growing in the wild in the United States, Canada, and Greenland.

The curatorships are named in memory of Mr. and Mrs. John S. Lehmann, who were major benefactors of the Garden's research program. John Lehmann was a Garden Trustee from 1941 until his death in 1967, serving as President of the Board 1953-1958 and briefly as acting director during that time. Anne Lionberger Lehmann, who died May 22, 1991 at age 97, carried on her husband's devotion to the Garden and in 1981 became the first woman to receive the Henry Shaw Medal, the Garden's highest honor.

Dr. Davidse came to the Garden in 1972 after earning his Ph.D. at Iowa State University. He has been involved with *Flora Mesoamericana* since its inception in 1980. The first volume of the flora will be published this summer. In addition to *Flora Mesoamericana*, Dr. Davidse will soon participate in a project that involves grasses exclusively. *Grasses of the New World* will provide a modern, detailed, computerized floristic inventory of the grasses of the Western Hemisphere.

Dr. Morin came to the Garden in 1981, as administrative curator of the herbarium and editor of the *Annals*. She received her Ph.D. from the University of California at Berkeley and was a postdoctoral fellow in the botany department of the Smithsonian Institution in Washington, D.C. She has been instrumental in building the Garden's botanical database, TROPICOS, into a powerful tool used by all research projects at the Garden and by many researchers around the world. In addition to her role as convening editor of the *Flora of North America*, she is on the editorial board of the *Flora of China* project, a joint Sino-American project to translate into English and revise the massive Chinese-language *Florae Reipublicae Popularis Sinicae*, a catalog of the plants growing in China.

"Honoring two such outstanding scientists with these curatorships seems a fitting tribute to their achievements and to Mr. and Mrs. Lehmann," said Dr. Peter H. Raven, director of the Garden. "Support such as that of the Lehmanns is the lifeblood of a private institution such as the Missouri Botanical Garden. The Lehmanns are part of a whole line of benefactors, from Henry Shaw to the present, to whom we owe a great debt of gratitude."

Gerrit Davidse and the Flora Mesoamericana *project were profiled in the January-February 1992 issue of the* Bulletin*—Editor.*

PROFILE

Nancy R. Morin, Ph.D., Anne L. Lehmann Curator of North American Botany

NANCY MORIN has worn many hats since she came to the Garden in 1981. She worked for five years as curator of the herbarium and editor of the *Annals*, then assumed leadership of the *Flora of North America* Project in 1986. In 1988 the Garden created the department of Botanical Information Management, and Morin was named head of that as well.

This would be an extraordinary achievement for any scientist, but Morin did not pursue a career in science immediately. "I grew up in California, a wonderful place for plants," she says, "and I studied liberal arts and worked as a legal secretary for a while. In the early 1970s I began taking some botany courses at San Francisco City College and was hooked. I went on to the University of California at Berkeley, which has a splendid program in taxonomy and botany, where I earned my doctorate. After a one-year fellowship at the Smithsonian Institution, I came to the Garden. I think that all of my experiences have enriched my work as a scientist."

Information management using computers has made great progress at the Garden in recent years, thanks to the fundamental work by Dr. Robert Magill and Dr. Marshall Crosby. Morin says, "We are very excited about the new possibilities opened up by computerization. It makes the data easier to use, and it is becoming possible to use information in important new ways. Our database is a tool for understanding the underlying relationships between plants and their environment, for learning to manage our natural resources."

FNA

FLORA OF NORTH AMERICA

A Landmark Project for the 21st Century

"NO continental flora has ever tried to do all of the things we're doing," said Nancy Morin, convening editor of the *Flora of North America*. "We will have all parallel descriptions, plus illustrations and maps. The accompanying database will eventually contain all of the published information plus even more extensive and detailed data. We also have a database at the Hunt Institute for all references and sources, which is being used to produce the bibliographies. There has never before been one place to obtain all of this information."

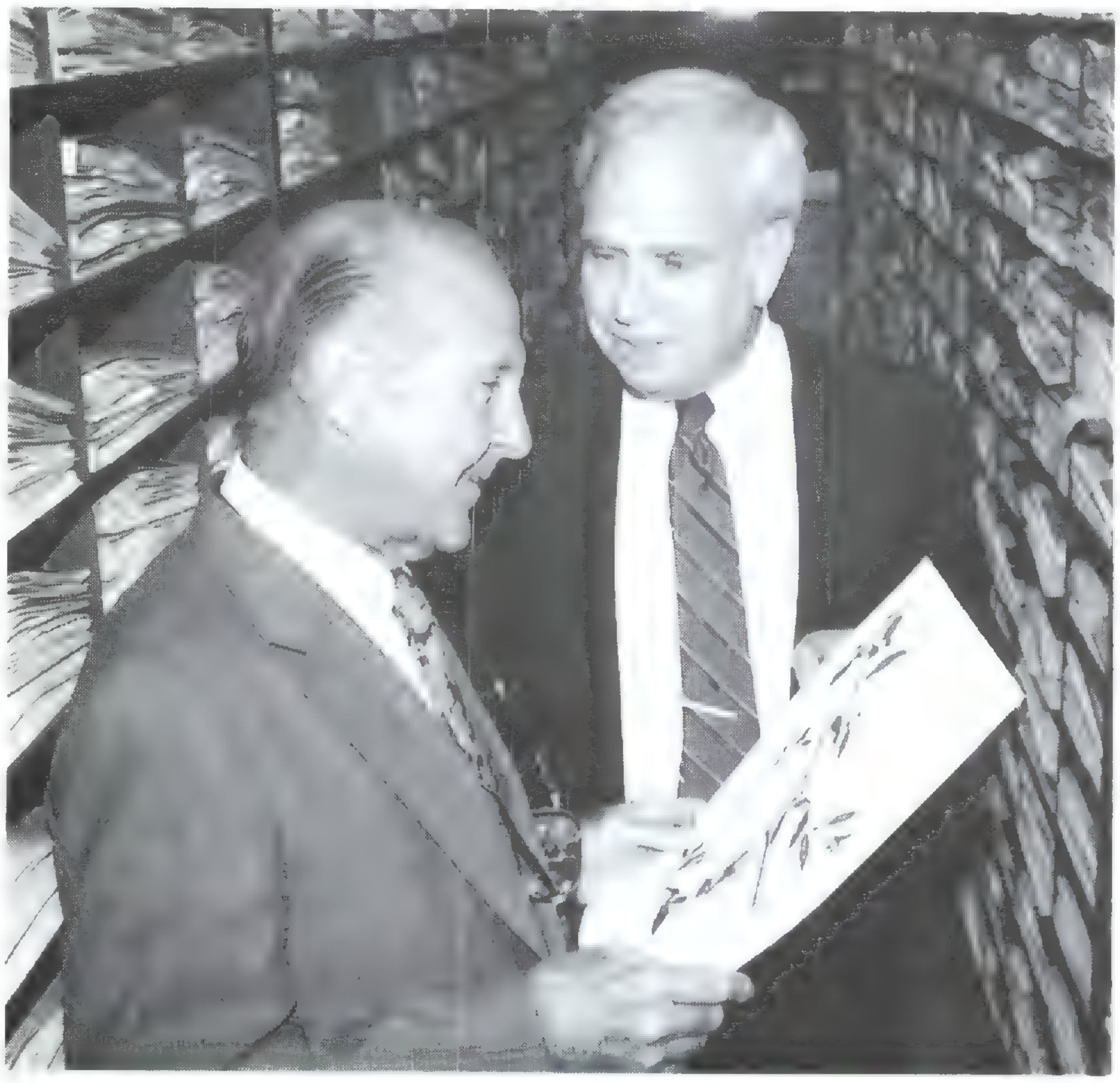
As the first volume of the *Flora of North America* (FNA) nears publication, it represents the culmination of ten years of work, and a milestone in efforts that began 160 years ago with John Torrey and Asa Gray's attempt to produce a comprehensive flora of the continent. The *Flora of North America* has built upon regional floras, monographs, and previous efforts to produce a comprehensive flora. "It has been designed to draw upon the expertise of the entire systematic botany community and to make the best possible use of the literature and herbarium specimens that are essential resources for the project.... A continental flora provides a catalog of the plant resources available within the area and their status—it can be used as a gauge to assess environmental change and as a tool to help manage these resources in the future."*

Volume I of FNA will be published in late 1992 or early 1993 by Oxford University Press. It will treat ferns and gymnosperms and will include all of the introductory material for the project: discussions of climate, geology, the history of vegetation and its current status; expeditions and research; and discussions of overall classification and how to use the book. FNA describes all plants growing wild in the United States and Canada.

"We have conquered the hardest phase, establishing how to make the project work," Morin said. FNA is working on many plant groups simultaneously, and subsequent volumes will appear approximately every year for the next twelve years. Missouri Botanical Garden is the organizational center for the project, which is a collaborative effort by more than 20 major botanical institutions in the United States and Canada.

Nancy Morin said, "The cooperation among all of the participants has been wonderful. There has been a synergy created by the collaboration that has been exciting and extraordinary. It's a privilege to be part of it."

**History of the Flora of North America Project*, by Nancy R. Morin and Richard Spellenberg, 1992.



RICHARD BENKOF

Dr. Armando T. Hunziker, left, visited the Garden in June. Dr. Hunziker is director of the* Flora of Argentina *project at the Universidad Nacional de Cordoba for CONICET and is an international authority on the Solanaceae (tomato) family. He is shown in the Garden's herbarium with Dr. Peter H. Raven.

Four Millionth Specimen Is Added to the Herbarium

AT a ceremony in the John S. Lehmann Building on May 20, 1992, a woody vine from the rain forests of central Africa became the 4,000,000th numbered specimen in the herbarium collection at the Garden. What may prove to be an undescribed species of a poorly known African and Asian genus, *Ancistrocladus*, was collected in Congo by Missouri Botanical Garden botanists under a contract with the National Cancer Institute to obtain samples of African plants for screening for pharmacological activity. Preliminary testing indicates that this species may have properties of interest to researchers working on potential treatments for HIV.

The four millionth specimen was mounted on archival quality, acid-free paper during a meeting of the Garden's Board of Trustees, with the assistance of Dr. James Solomon, manager of the Herbarium, and Jean Digby, one of the Garden's 20 plant mounters. "The Missouri Botanical Garden has been collecting and studying botanical specimens for more than 125 years," said Dr. Peter H. Raven, director. "We are delighted to make this specimen number 4,000,000, as it is symbolic of mankind's limited knowledge of the biological diversity occurring with us on Earth and the potential benefit which may be derived from this plant—and from thousands more yet undiscovered in the tropical rain forests."

The Garden's herbarium is one of the four largest in the United States, and has worldwide representation of mosses, ferns, gymnosperms, and flowering plants. The nucleus of the Garden's collection was the Johann Jakob Bernhardi herbarium containing approximately 62,000 specimens purchased in 1857 for Henry Shaw by George Engelmann, a St. Louis physician and one of the foremost botanists of the 19th century.

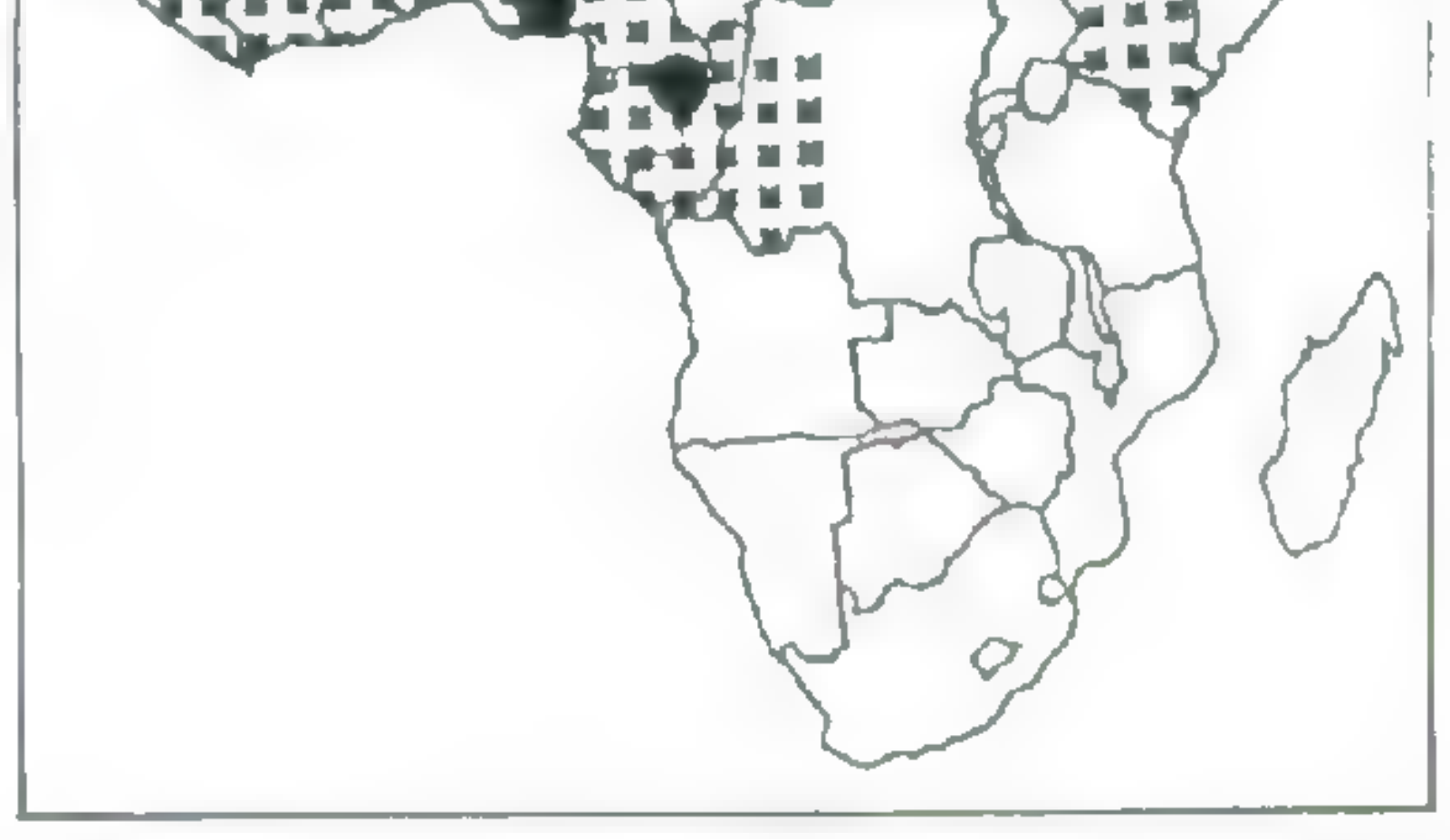
The Bernhardi Collection, assembled during the late 18th and early 19th centuries, contains many important historical specimens from South America, Asia, Africa, and Europe. George Engelmann's private herbarium of about 100,000 specimens, was donated by his family to the Garden in 1890, and contained major collections from many of the 19th century exploring expeditions to western North America and northern Mexico. From this beginning the Garden's herbarium has developed into an outstanding international research resource with a major emphasis on the New World and African tropics and North America.

Given proper care, herbarium specimens will last for centuries. The Garden's collection contains plant specimens collected by George Boehmer from the 1740s, by Joseph Banks and Daniel Solander, who accompanied Captain James Cook on his first voyage around the world in 1768-71, and by Charles Darwin on his voyage with *H.M.S. Beagle*, 1831-36. These specimens are as useful to botanists today as they were when they were gathered.

More than 250,000 kinds of vascular plants inhabit the earth. Botanists base much of their knowledge of these organisms on dried specimens that have been carefully labeled, mounted, and stored in herbarium collections. Several thousand new species of plants are discovered and described by researchers worldwide every year from herbarium collections. The specimens often come from parts of the world previously unexplored by botanists, but a surprising number are found in areas which have already been visited many times.

Botanical research is an international endeavor which depends on close collaboration between the world's herbaria and botanists to effect progress. As a result of the Garden's active collecting and specimen exchange program, the herbarium is mounting and adding an average of 105,000 specimens per year to the collection. Specimens are then made available for study by researchers throughout the world as loans (averaging 40,000 specimens annually), as well as through many thousands of gift specimens sent to specialists for their authoritative examination and identification. In addition, more than 500 visiting researchers work in the herbarium and library each year.

WORLDWIDE EXPLORATIONS



Shown at the ceremony for the four millionth herbarium specimen are (from left) O. Sage Wightman III, president of the Board of Trustees; plant mounter Jean Digby; and Dr. Peter H. Raven. At right: Regions of Africa where* Ancistrocladus *occurs, and the two locations where this species has been collected.

Teachers investigate the ecology of the Meramec River.

ECOLOGY FOR TEACHERS

Learning by Doing

A WARM, sunny spring day in April found 30 teachers and several staff from the Garden's Education Division in canoes on a stretch of the Meramec River. The trip's purpose, to familiarize the teachers with stream ecology, placed the educators in the role of explorers. They tested the water quality of the river and adjacent creeks and collected aquatic organisms to see what plants and animals lived there, making the correlation between the type and quality of a habitat and the animals it supports. With nets in hand the participants were excited and enthusiastic as they caught tadpoles, crayfish and dragonfly nymphs.

This trip was part of a year long graduate level course, "Ecology for Teachers" for educators of grades 4 through 8. Funded by the National Science Foundation, the "Ecology for Teachers" program is designed to give participants a strong background in ecology and environmental science and to provide them the opportunity to create ecology curriculum for use with their own students. Nearly 90 teachers will have completed the course when the 1991-92 school year ends. The teachers, in turn, reach thousands of students each year, multiplying the impact of the course.

Using the Garden and Shaw Arboretum as bases, the teachers gathered for sessions in October and November, as well as in April. They experienced the concepts they were to learn through varied activities that they could, in turn, take back to their own classrooms. Each teacher selected two ecology concepts to focus upon, and designed learning cycles, an innovative and effective hands-on teaching strategy, based on each concept, which they implemented with their students.

The teachers found the learning cycle instructional strategy to be effective with their students and appreciated the exposure to many different resources in addition to their own increased knowledge and understanding of ecology. One participant commented, "I found this to be a very helpful course in expanding and enriching my resources for classroom instruction. I felt that I was involved with a select group of high caliber teaching professionals and we learned a great deal from each other."

The thirty teachers from this year's session will reconvene for a final meeting in June, during which they will share information with one another about their projects, useful resources they discovered along the way and the highlights of their teaching experiences in the program. As one participant stated: "I truly grew from this experience. I feel as if I'm a part of the team (instructors and teachers taking the course) that is putting its energies where they are needed. I'm interested and excited to continue to grow in this area."

—Barbara Addelson
MBG Instructional Coordinator

Garden Classes and Tours Are a Hit with Visitors

"The Garden is always so hospitable to us," a teacher writes. "I cannot suggest any improvements. Thank you!"

These kinds of warm responses are typical of comments on evaluation forms returned to the Garden's education division. Since September 1991 the education staff have asked leaders of classes and tour groups visiting the Garden to respond to a questionnaire about the quality of the experience. About 90 percent of responses were completely positive, and others made minor suggestions for changes to improve the visit for students and volunteers alike.

Sandra Rode, manager of the educational services, said, "We have always known that our volunteer guides and instructors do a first rate job. Now we have very positive evidence from teachers and parents that our visitors think so, too."

"The guides and instructors are to be commended for their leadership in requesting evaluations from visitors," said Dr. Larry DeBuhr, director of education. "We value their willingness to look continually for ways to improve our programs."

The education staff continues to survey visitor responses to its programs to learn which aspects to emphasize in teacher training and how better to meet visitors' needs. "The activities and handouts were excellent," another teacher said. "Our instructor was very warm, happy and knowledgeable. She gave dignity to each student and his/her comment or question. Thank you very, very much!"

Missouri Botanical Garden

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and printing costs,

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is available on request.

To obtain a copy please stop in or write The Development Office, Missouri Botanical Garden, P.O. Box 299, St. Louis, MO 63166-0299, or call (314) 577-5120. Your 1991 Annual Report will be sent to you.

Purple Loosestrife on the Loose

RECENTLY I saw an aerial photograph of a marsh in Minnesota that showed acres of brilliantly colored lavender-pink blossoms. At first glance, the marsh was beautiful. However, a closer inspection was unsettling; the marsh vegetation was composed almost entirely of a single exotic species called purple loosestrife, *Lythrum salicaria*. Instead of the dazzling richness of vegetation typical of a freshwater marsh—with grasses, sedges and other aquatic plants that serve as home and food for large numbers of birds, insects, frogs, mammals and other aquatic organisms—this photograph illustrated how a single, exotic species can invade and completely dominate an entire ecosystem.

Purple loosestrife is just one of many plants termed exotic because they are nonnative, and invasive because they have characteristics that allow them to reproduce and quickly establish populations outside their home territory. Invasive species often can tolerate a wide range of environmental conditions, and may take advantage of habitat disturbances. An exotic species often lacks biological controls, such as parasites, predators or diseases, that hold their populations in check within their native habitat.

Population expansion of exotic plants and animals can result in severe environmental problems. For example, the gypsy moth (see the MBG *Bulletin*, March-April 1992), is an exotic insect that is causing extensive damage to forest trees in North America. Kudzu vine, *Pueraria lobata*, has completely covered and choked out entire landscapes in the southeastern United States. During a field trip to inspect glade habitats in southwestern Missouri, I was stunned to see how many of the glades were being overrun by introduced species of brome grass, or *Bromus*.

Gardeners need to be aware of purple loosestrife because we are often the agent of dispersal for this exotic pest, and we can help to control its spread. Originally from Europe and Asia, seeds arrived in northeastern North America from Europe in the early 1800s. Some seeds were in soils used as ballast in sailing ships, while other seeds were probably imported on sheep or in raw wool. Populations must have established quickly, because Asa Gray and John Torrey saw enough loosestrife to suggest it was native in *A Flora of North America* published in 1840. In this century, *Lythrum salicaria* and *L. virgatum*, another exotic species, have been valued for their beauty in the garden, and many cultivars of these handsome plants were developed.

Purple loosestrife, a member of the family *Lythraceae*, is an herbaceous perennial plant that can send up over thirty stems reaching two meters in height. Each stem can produce hundreds of flowers, and each flower can produce up to 100 seeds. In one study, purple loosestrife produced an average of 2,700,000 seeds per plant! Also, the stems of loosestrife can root and quickly establish new plants through vegetative reproduction. In other words, this species has the capability to produce many new plants by both seed and vegetative reproduction—one of the traits common to invasive plant species.

Unfortunately, loosestrife has virtually no value for marsh inhabitants; it displaces native plants, is a poor source of food, modifies microhabitats and colonizes nest sites. One estimate suggests that purple loosestrife costs $45 million annually in control measures, costs to wildlife and agriculture, and clogging of waterways and drainage ditches.

In response to the spread of purple loosestrife, many states, including Missouri, have enacted laws that prohibit the sale, propagation and planting of this invasive species. Several loosestrife cultivars were believed to be sterile and were omitted from the list of banned plants. However, recent research has shown that the so-called "sterile cultivars" will produce seed when they come in contact with naturalized populations. All cultivars are also capable of vegetative reproduction. It is nearly impossible to distinguish one cultivar from the next, and several cultivars appear to be hybrids between *Lythrum salicaria* and *L. virgatum*. With this in mind, most states are strongly discouraging the planting of either of these species or their cultivars.

At the Garden, we have chosen to remove all of our loosestrife, with the exception of several plants in the perennial beds in front of the Linnean House. We will keep these plants so that our visitors can learn about loosestrife and how to identify it. The horticulturists will monitor vegetative growth and cut off any flowering heads before they go to seed. At the Arboretum, the staff has worked for several years to eliminate the naturalized population of *Lythrum salicaria* that grew around Pinetum Lake.

For the gardener, other beautiful perennials can replace purple loosestrife in your flower beds. Blazing star (*Liatris*), vervain (*Verbena*) and bellflower (*Campanula*) are just a few. But, please do not mistake any of our lovely native perennials for exotic loosestrife.

The Missouri Department of Conservation wants to know about populations of purple loosestrife, which are easily identified during their blooming season from late June through August. You can request information or send them loosestrife localities by writing to: Purple Loosestrife Alert, MDC, P.O. Box 180, Jefferson City, MO 65102.

—Lucile McCook
Horticultural Taxonomist

Students Help To Create New Wetlands Area at Shaw Arboretum

This past May, the large new Wetlands Area at Shaw Arboretum was planted with assistance from students participating in the Henry Shaw Academy (HSA) Program. In early May the students collected native wetland plant materials from the Mingo Swamp Wildlife Refuge in southern Missouri. These specimens, plus an additional 12,500 wetland plants, were added to the new Arboretum area on May 23.

"The students are learning more about the importance of America's wetlands while making a significant contribution to the Arboretum," said Jeff DePew, coordinator of the Henry Shaw Academy. "In the past 20 years more than 11 million acres of wetlands have disappeared from the nearly 100 million acres of wetlands that were in America as late as the mid 1970's."

The work being done by the HSA students will be available for all to enjoy for generations to come.

During a two-day field project that included an overnight excursion to the Mingo Swamp Wildlife Refuge, high school students participated in a boardwalk journey through the swamp, and examined aquatic and terrestrial plant life characteristics and adaptations to the permanent wetland. Field trips are an important part of the HSA program, allowing students to actually experience the ecosystems they study.

May is American Wetlands Month. Wetlands are vital to flood control, erosion prevention, fish and wildlife habitats and outdoor recreation. The Garden is a recognized sponsor of Wetlands Month and is actively involved in canoe trips, trash clean-up programs, wetlands restoration and dissemination of educational materials. A wide coalition of groups are working to increase public awareness of productivity to wetlands through the nation.

The wetlands area at the Arboretum will be accessible to the public upon its completion later this spring. For more information about the Henry Shaw Academy contact Jeff DePew at 314-577-5135.

Henry Shaw Academy students at Mingo Swamp.

Jeff DePew (left) and students plant wetlands area at the Arboretum.

Center for Plant Conservation

Plant Sponsorship: a Personal Commitment to Plant Conservation

For some people, the terms "plant conservation" and "preservation" are merely concepts. But for Mrs. Judy Freeman of New Orleans, these words have special meaning. Mrs. Freeman spearheaded the Zone IX Garden Club of America project to sponsor Price's potato-bean (*Apios priceana*) in the Center for Plant Conservation's National Collection of Endangered Plants. The garden club members join a growing number of other groups and individuals who are taking an active role in preventing the extinction of U.S. plants.

"The goals of the Garden Club of America and the Center for Plant conservation are closely aligned," said Mrs. Freeman. "Zone IX members accepted the challenge of plant sponsorship as an effort at furthering plant conservation."

The National Collection consists of living plant samples of endangered species. The plants are non-destructively collected from the wild and represent to the greatest extent possible the genetic diversity found in natural populations.

The Center's 25 Participating Institutions stock and maintain the Collection. Locally, the Missouri Botanical Garden has 16 species in the Collection. Price's potato-bean is one of two plants sponsored at the Garden.

The expenses of establishing and maintaining the Collection include field collecting and surveys, seed preparation, storage, documentation, and the living plants in cultivation. Plant sponsorship offsets these expenses.

"Sponsoring a plant in the National Collection requires making a personal commitment to saving our native flora," said Don Falk, CPC director. "Protective cultivation is the only means of ensuring the survival of many threatened or endangered plants."

One-fifth of the 20,000 species of plants in the United States is endangered. Approximately 800 of those plants may become extinct within 10 years.

Plants may be sponsored by individuals, garden clubs, corporations and family foundations, among others. Sponsors select a preferred species from a list of current accessions available from the Center. They receive a botanically accurate watercolor by noted artist Bobbi Angell, a Certificate of Sponsorship and recognition in Center publications.

For more information about how to sponsor a plant in the National Collection of Endangered Plants. call the CPC at (314) 577- 9450.

Home Gardening

Fragrant Woodies

NEW IDEAS

Rather than focusing on the familiar fragrance plants such as roses, scented viburnums, lilacs, and mockoranges, a glance at some less common trees, shrubs and vines will serve as an introduction to new ideas for St. Louis gardeners.

In any other year a discussion of fragrance would have to include the many magnolia species and hybrids that form the backbone of our gardens. It is painful to see the havoc wreaked upon them by frost this year. It will take careful pruning, some tender loving care and the passage of much time for their full recovery. It is interesting to observe that the magnolia least fazed by our variable weather is the native ''Cucumber tree,'' *Magnolia acuminata*. It serves as a reminder of the value of including native, hardy species in our gardens.

WINTER

A walk through a fragrant garden need not be confined to the summer months. The calendar year begins with January and on mild, sunny days at that time of year, the native Ozark witch hazel, *Hamamelis vernalis*, first blooms, spreading its sweet musty scent far and wide on light breezes. By the end of February its blossoms are spent, but not before it is joined in bloom by the hybrid witch hazel, *H. x intermedia*. These in turn are followed by the Chinese witch hazel, *H. mollis*. Witch hazels often develop a picturesque spreading branch habit and their bright yellow fall color is an added bonus.

Another winter bloomer is the Korean abelialeaf *Abeliophyllum distichum*, also known as the ''white forsythia.'' Often flowering in February or early March along with the first snowdrops and winter aconite, its honey-scented flowers draw foraging bees at a time when few other plants bloom. Late February and March bring the delightfully lemon-scented winter honeysuckles, *Lonicera fragrantissima* and *L. standishii*, into flower. These old-fashioned shrubs open their flowers over a long season as the weather obliges. Often described as coarse, the winter honeysuckles have a somewhat graceful, arching habit, providing they are not crowded by their neighbors.

EARLY SPRING

Mid-April brings the native dwarf fothergilla, *Fothergilla gardenii*, into bloom. Related to the witch hazels, fothergilla has an interesting white flower spike that resembles a small bottlebrush. A versatile shrub for sunny areas as well as woodland settings, its autumn leaves turn a brilliant yellow in shade or orange-scarlet in sunnier locations.

With the onset of warmer weather in early May, the fringetree, *Chionanthus virginicus*, unfolds its extraordinary long, fleecy flowers that give rise to its other common name ''old man's beard.'' The sweet, refreshing blooms are effective up to three weeks in cooler springs. One of our loveliest native trees, the fringetree can be planted as a single specimen or in groups. Its flowering period parallels that of another outstanding native, the pagoda dogwood, *Cornus alternifolia*. Rarely mentioned in books on fragrant plants, its sweet, agreeable scent is especially noticeable on warm evenings. Perhaps the finest attribute of the pagoda dogwood is the strong horizontal habit of its branching pattern, which lends a great deal of interest to the winter garden.

Also flowering in early May is the crossvine, *Bignonia capreolata*, a climber unfamiliar to most gardeners, though it is an easily grown native. The trumpet-shaped flowers, colored a brownish-orange with yellow tubes, are attractive to migrating hummingbirds. The scent bears a hint of chocolate and is best detected from close range. The foliage is evergreen, though it may appear worn by spring. New leaves grow quickly by late May, at the end of the flowering period.

A non-native climber also flowering in early May is the Chinese kiwi, *Actinidia kolomikta*. Its small white blossoms bear a heavy fragrance, but the scent lingers at the open flower, to be discovered only by the adventurous nose. Fragrance aside, the main attraction in this vine is the showy foliage. Once the green leaves expand, they develop an unusual variegation with up to half of each leaf turning first white and then pink. As the summer wears on, the leaves revert to green.

SUMMER

Moving into late May, the native Virginia sweetspire, *Itea virginica*, sends up long racemes of white flowers bearing a sweet, clean perfume. It is joined in bloom by the similar Japanese sweetspire, *Itea japonica*. These plants bloom at a time when few other shrubs flower and an added bonus is their late fall color in bright, reddish shades. 'Henry's Garnet' is a native sweetspire selected for its outstanding autumn coloration. About mid-June, when the sweetspires are going past, the bottlebrush buckeye, *Aesculus parviflora*, opens its foot-long spikes of white, lightly scented blossoms. Few summer bloomers, much less other woodies, compare to the sight of a large clump of this shrub in flower. Slow to become established, this southeastern native is worth the wait, once it matures.

Perhaps the most versatile of all garden shrubs is the summersweet, *Clethra alnifolia*. Native to the eastern U.S., this shrub will grow in sun or shade, in wet or dry sites, and also tolerates clay soils. What more can be asked of a June-flowering plant so generous with its sweet spicy fragrance that homeward-bound whalers detected its scent far out at sea, earning it the name ''Sailors' Delight?'' Another plant capable of exuding fragrance over a large area is a linden tree. There is a huge old bigleaf linden, *Tilia platyphyllos*, on the Knolls at the Garden that perfumes the western Shaw neighborhood when it flowers each June. The native linden, or basswood, *Tilia americana*, produces a nectar that bees gather to produce honey of the finest quality.

One of the weediest plants I will ever recommend is also one I would never be without. The sweetautumn clematis, *Clematis paniculata*, is a rampaging vine native to Japan. Thriving on neglect, as long as you remember it often enough to occasionally curtail its exuberance with some timely pruning, it won't quite succeed in enveloping your entire garden. The battle is forgiven and forgotten for that two-week stretch in August when it instead envelops your garden with a sweet vanilla scent that lingers both day and night.

AUTUMN

As the gardening year winds down through autumn one final fragrant delight awaits as the leaves begin to fall and the first snaps of frost are in the air. This is the time when the eastern witch hazel, *Hamamelis virginiana*, blooms with its characteristic scent, the last woody to do so. Usually effective for two to four weeks, in some years the blooms last long enough to be joined in fragrance by its fellow native the Ozark witch hazel as it passes the torch to the new year and the cycle repeats again.

—Chip Tynan,
MBG Horticulturist

Timely Tips from the Answer Service

Do you have a plant question? Call the Horticultural Answer Service, Monday through Saturday, 9 a.m. to noon, at ***577-5143.***

July Tips

- Perennials that have finished blooming should be deadheaded. Cut back the foliage to encourage a tidier appearance.
- Remove infected leaves from roses. Pick up fallen leaves. Continue fungicidal sprays as needed.
- Newly planted trees and shrubs should continue to be watered thoroughly, once a week.
- Prune climbing roses and rambler roses after bloom.
- Spray hollies for leaf miner control.
- Divide and reset oriental poppies after flowering as the foliage dies.
- Fall webworms begin nest building near the ends of branches of infested trees. Prune off webs. Spray with B.T. if defoliation becomes severe.
- To minimize insect damage of squash and cucumber plants, try covering them with lightweight floating row covers. Remove covers once plants flower.
- Cover grape clusters loosely with paper sacks to provide some protection from marauding birds.
- Water turfgrass frequently enough to prevent wilting. Early morning irrigation allows turf to dry before nightfall, reducing the chance of disease.

August Tips

- Continue spraying roses that are susceptible to black spot and other fungus diseases. Roses should receive no further nitrogen fertilizer after August 15th.
- To grow big dahlia blooms, keep side shoots pinched off, water and fertilize plants regularly.
- Order bulbs for fall planting.
- Pinch the growing tips of gourds once adequate fruit set is achieved, to direct energy into ripening fruits rather than producing vines.
- Plant lettuce and radishes for fall at mid-month.
- Spray peach and other stone fruit trees to protect against peach tree borers. Cultivate strawberries. Weed preventers can be applied immediately after fertilizing.
- Monitor plants for spider mite activity. Hose off with a forceful spray of water.
- Watch Scotch and Austrian pines for Zimmerman pine moth damage. Yellowing or browning of branch tips and presence of pitch tubes near leaf whorls are indicative. Prune and destroy infected parts.
- Hummingbirds are migrating through gardens by mid-month.

—Chip Tynan, The Answer Service

UNION PACIFIC SUPPORTS ENERGY EFFICIENCY—Robert L. Barley (left), assistant vice president, data centers, for Union Pacific Railroad, presented a check for $30,000 to Peter Raven in June. It represents the final installment of a $60,000 grant from Union Pacific Foundation to help support energy efficiency improvements to the Ridgway Center. "Union Pacific's generous support will allow us to complete these improvements by the end of 1992," Raven said. "This allows us to devote more of our resources to serving the community."

Missouri
Botanical
Garden

OPERATION CLEAN STREAM CELEBRATES 25 YEARS—The 25th annual Operation Clean Stream will be held August 22. Volunteers remove debris from the Meramec River (shown above) to help maintain the region's waterways. For more information or to volunteer please call Shaw Arboretum at 1-742-3512 (toll free from St. Louis).

Missouri Botanical Garden

CALENDAR OF EVENTS

July-August 1992

"Kids In Bloom"

July is Children's Month at the Garden

Throughout July join us as we present events especially for children and their families. "Kids in Bloom" is sponsored by KMOV-Channel 4 and their Family Works partners Dierbergs and Missouri Baptist Medical Center.

There will be a special MoBot Express tram tour especially for children whenever a Kids in Bloom event is held. Fare is $.50, and adults must be accompanied by a child.

Tickets for some Kids in Bloom programs in Shoenberg Auditorium will go on sale June 15, 1992 at the Ridgway Center Ticket Counter. Call 577-5125 for further information on events.

Kemper Center for Home Gardening

Open 10 a.m. to 4 p.m. daily. Plant Doctor available 10 a.m. to noon and 1 to 3 p.m. Monday through Saturday. Free with regular Garden admission.

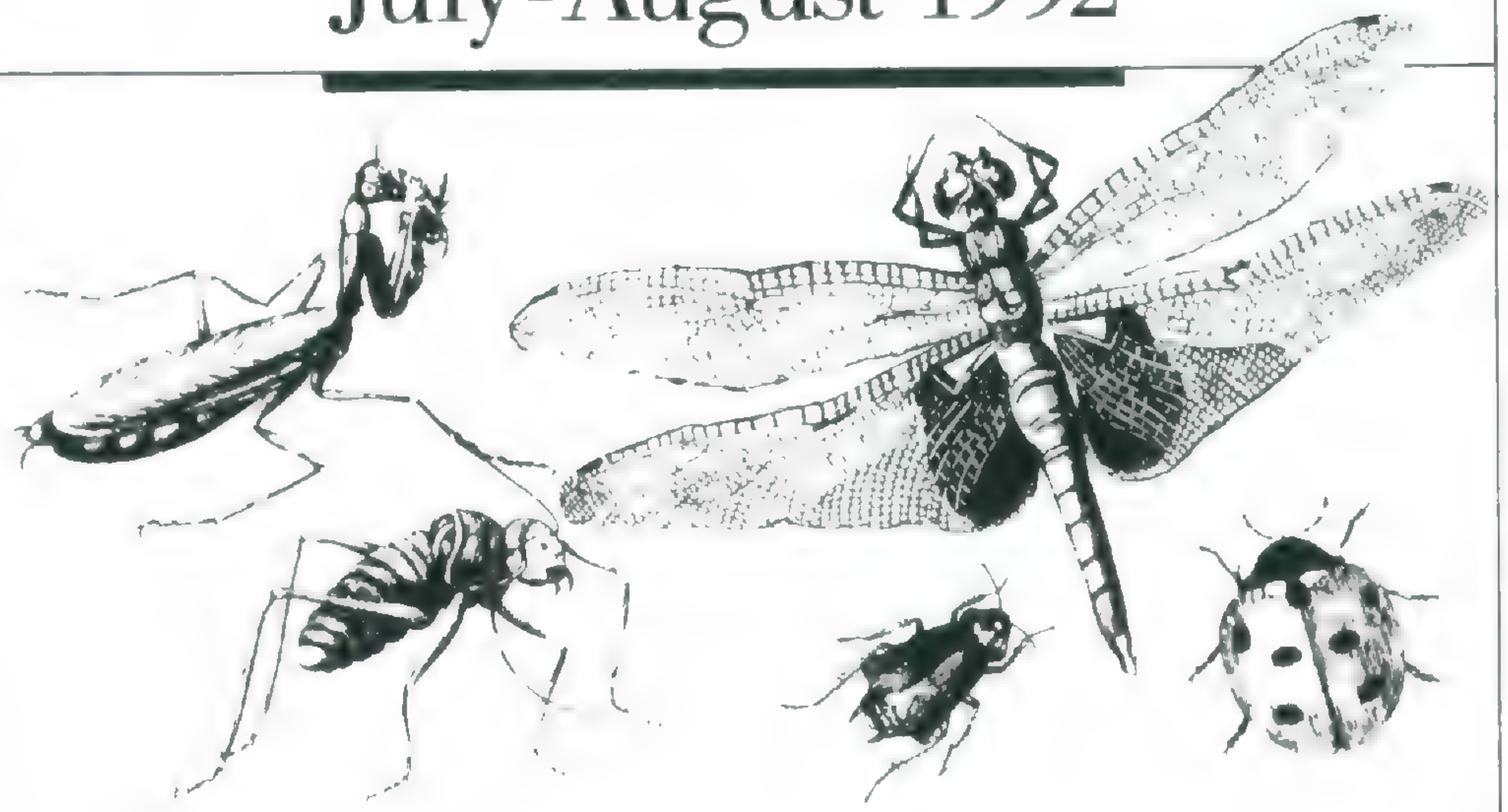
Master Composter Hotline: 314/577-9555

Tower Grove House Tea Room

Open for luncheon Monday through Friday, 11:30 a.m. to 1 p.m., February through November, plus special Holiday Luncheons in December; advance reservations only. Call 577-5150.

Garden Walkers' Breakfast

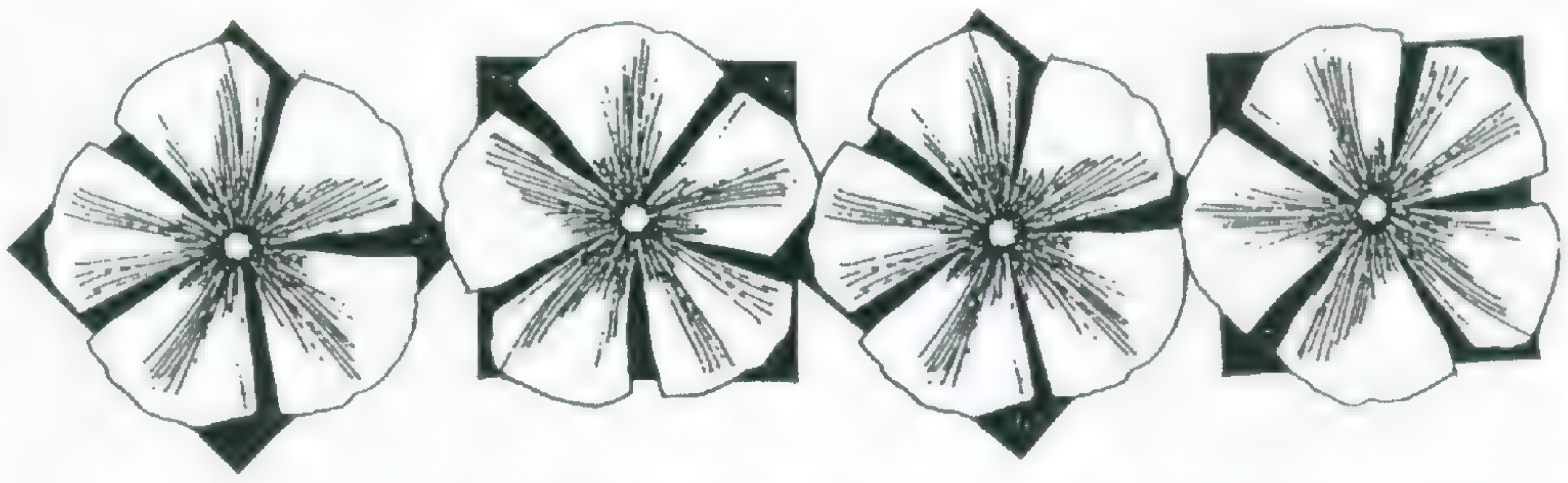
7 to 10:30 a.m., every Wednesday and Saturday. Restaurant and grounds open early; free admission until noon. Sponsored by the American Heart Association. Call 577-5125 for information.



July — August 23 / Bug's Eye View

9 a.m. to 7:30 p.m. daily, Brookings Interpretive Center. Experience a thrilling exhibit where the world is seen from an insect's point of view. Huge leaves, flowers and insects create a wondrous environment that enhances our understanding of Earth's most diverse and successful life form. Jointly sponsored by the Saint Louis Zoo, St. Louis Science Center and the Missouri Botanical Garden.

SPECIAL TOURS: July 1, 8, 15, 22, 19, and August 11, 25; tours leave from Ridgway Lobby at 9:30 and 11 a.m. and 12:45 p.m. Exhibit and tours are free with regular Garden admission.



Sunday, July 12 / Rosy Periwinkle Celebration

11 a.m. to 3 p.m., Ridgway Center and grounds. A salute to the Rosy Periwinkle, the plant source for the cure for childhood leukemia and Hodgkin's Disease. Join us for a day of activities and events that focus on the Rosy Periwinkle and the role plants play in providing modern medicines. From collection by botanists to studies and manufacture by pharmaceutical companies to use by doctors and their patients, you will gain a deeper appreciation of the uses of plants.

Festival *of* Festivals

August 1 & 2; 8 & 9; 15 & 16; 22 & 23

See back cover for details.

JULY

1 WEDNESDAY

Children of the World Paint
Single Language

9 a.m. to 8 p.m. daily through
26, Ridgway Center. Exhibit b
Paintbrush Diplomacy include
art works by children ages 4 t
from 38 countries. Free with
regular Garden admission.

Children's Film Festival
Jetsons: The Movie

11 a.m. and 1:30 p.m., Shoen
Auditorium, every Wednesda
July. Doors open 30 minutes b
showtime. $1 for members an
dren, $2 non-members. Ticke
all films go on sale June 15, 19
the ticket counter. Seating is
limited.

4 SATURDAY

Home Irrigation Systems

12:30 to 2:30 p.m., Kemper
Display and demonstration by
Master Gardeners. Regular G
admission.

6 MONDAY

Folklore and Legends

11 a.m. to 4 p.m., Shoenberg
Auditorium. Storytelling with
Norfolk, Janet Kiefer, Blake
and Young Audiences perform
Chris Limber and Ruthilde Kr
All sessions free with regular
Garden admission.

Plant Clinic

10 a.m. to noon, Kemper Ce
Bring your plant problems fo
expert diagnosis and advice;
samples are suggested. Spon
by MBG Master Gardeners,
Missouri Department of Con
tion, University Extension,
St. Louis County Soil and Wa
Conservation District, and St
County Department of Parks
Recreation. Free with regula
Garden admission.

continued

WEDNESDAY

ren's Film Festival
reat Muppet Caper
n. and 1:30 p.m. See July 1 for
s.

SATURDAY

ting the Right Mulch
to 2:30 p.m. See July 4 for
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WEDNESDAY

ren's Film Festival
almatians
. and 1:30 p.m. See July 1 for
.

SATURDAY

Bugs!
n. to 3 p.m., Ridgway Center
rounds. A delightful day
ing craft and plant workshops,
t shows, life-size bugs
ng the grounds and more
ies highlighting the ''Bug's
iew'' exhibit in the Brookings
retive Center. Free with
r Garden admission.

Gardening
to 2:30 p.m. See July 4 for
.

MONDAY

Clinic
. to noon. See July 6 for
.

WEDNESDAY

en's Film Festival
Chitty Bang Bang
. and 1:30 p.m. See July 1 for
.

24 FRIDAY

Henry Shaw's Birthday Party—KMOV-Channel 4 Family Works Day

11 a.m. to 4 p.m., Ridgway Center and grounds. Celebrate the 192nd birthday of the Garden's founder with one of America's favorite entertainers, David Parker, the Pied Piper of Sign; singer-songwriter David Williams; clowns, costumed characters, stiltwalkers, an organ grinder, and much more. KMOV personalities will be on hand to help with the celebration. Free with regular Garden admission.

25 SATURDAY

Tomato Disorders

12:30 to 2:30 p.m. See July 4 for details.

26 SUNDAY

Iris Society Rhizome Sale

11 a.m. to 5 p.m., Ridgway Center. The Greater St. Louis Iris Society will hold its annual sale of the surplus rhizomes grown at MBG. All proceeds support the iris collection at the Garden. Free admission.

28 TUESDAY

Puppets Galore

11 a.m. to 4 p.m., Ridgway Center. Puppet shows by Kramer's Marionnettes, The Dallas Puppet Theatre, Hystopolis, and Earth Mirrors, plus roaming life-size puppets to delight children of all ages. Tickets to performances are $1, and go on sale June 15, 1992 at the ticket counter. Seating is limited.

29 WEDNESDAY

Children's Film Festival
Honey, I Shrunk the Kids

11 a.m. and 1:30 p.m. See July 1 for details.

MEMBERS' EVENTS

July 14
Members' Day Moonlight Stroll

9 to 11 p.m.
Back by popular demand and featuring a ''real'' full moon! Cash bar. Free, for members only.

August 13
Members' Day ''Herb Day''

10 a.m. to 3 p.m.
Members of the St. Louis Herb Society guide tours through the Herb Garden behind Tower Grove House and answer questions. Purchase a variety of herb products produced locally by Herb Society members. Free, for members only.

AUGUST

1 SATURDAY

Pumps for Fountains and Waterfalls

12:30 to 2:30 p.m. See July 4 for details.

3 MONDAY

Workshop: Pollination Pals

10:30 a.m., Ridgway Center. Children ages 9 to 11 explore the fascinating world of pollinators and learn how plants and animals have formed an interdependency that keeps the earth green. Reservations are required and enrollment is limited; call 577-5125. $1.50 per child.

Plant Clinic

10 a.m. to noon. See July 6 for details.

8 SATURDAY

How to Harvest and Dry Flowers

12:30 to 2:30 p.m. See July 4 for details.

15 SATURDAY

Fall Vegetable Planting

12:30 to 2:30 p.m. See July 4 for details.

17 MONDAY

Plant Clinic

10 a.m. to noon. See July 6 for details.

22 SATURDAY

Lawn Grasses for St. Louis

12:30 to 2:30 p.m. See July 4 for details.

29 SATURDAY

Container Gardening

12:30 to 2:30 p.m. See July 4 for details.

Henry Shaw Cactus Society Show

9 a.m. to 8 p.m., daily through September 7. Orthwein Floral Display Hall. Free with regular Garden admission.

31 MONDAY

Plant Clinic

10 a.m. to noon. See July 6 for details.

WALKING TOURS
Every Tuesday, Saturday and Sunday 1:00 p.m.

Join the Garden Guides for a tour of the grounds, featuring the art, architecture, history and horticulture of the Garden. Meet at the ticket counter in the Ridgway Center. Free with regular Garden admission.

From the Membership Office

COMING EVENTS

"Missouri Country Affair"

FRIDAY, OCTOBER 9, 1992

A party to benefit the Garden.

and

"Best of Missouri Market"

SUNDAY, OCTOBER 11, 1992

An all day celebration featuring Missouri food, specialty products, plants, music, cooking demonstrations, and more!

Watch your mail for details.

Missouri Botanical Garden
MARCHING FLOWERS

The Missouri Botanical Garden Marching Flowers participated in the Shaw Neighborhood Togetherfest Parade, Saturday, May 30 (above). Made up of a group of children from the St. Louis area, the Marching Flowers also performed in the Annie Malone Parade, Sunday, May 17.

Garden Is Named Network Center by Alliance for Environmental Education

The Missouri Botanical Garden, through its Education Division, has been designated a Network Center by the Alliance for Environmental Education.

Network Center status is achieved only after the programs at an institution are determined to meet the qualifications of the Alliance in four areas: 1) Professional Teacher Development; 2) Community Outreach, 3) Curriculum, Program and Materials Development and Dissemination, and 4) Research and Evaluation.

At present, 131 other Network Centers have been designated, with most located in the United States. About two-thirds of these are located at colleges and universities. The Garden is the only Network Center in Missouri. "Being named a Network Center is a reflection of the nature and quality of the environmental programs at the Garden," said Dr. Larry DeBuhr, director of education. "We are very happy to have achieved this honor."

Garden Awarded $75,000 by Institute of Museum Services

The Institute of Museum Services (IMS), a federal agency that offers general operating support to the nation's museums, has awarded the Garden $75,000, its maximum award, to support basic services and programs.

The grant was one of 443 awarded this year through a nationwide competition that values all aspects of the museums' operation. Awards are made to museums that have demonstrated excellence in all areas of museum operations. Applications were received from 1,428 museums of all types from throughout the country.

The Institute of Museum Services provides the only federal source of general operating support for the nation's museums. It was established in 1976 by Congress as an independent federal agency to assist museums in their efforts to preserve the nation's cultural, historic, and scientific heritage.

Special Thanks to Our Volunteers

Seated, left to right: Joe Meis, Gert Pappert, Arden Fisher, Dorothy Olson, director Peter H. Raven, Sue Reisel. Standing, left to right: Laura Riganti, Lorraine Hatscher, volunteer coordinator Jeanne McGilligan, Dorothy Hitt, Kay Sofian, Betty Sims, Frank Enger, Helen Hilliker, Pauline Jaworski, Pauline Kittlaus, Mary Jane Kirtz, Susan Schreiber, Margaret Abbott, Marian Herr, Joan Murphy, Sallie Wood.

On April 22, 1992, the Garden paid tribute to volunteers who have completed ten or twenty years of service, at a special luncheon in their honor. **Celebrating twenty years** were Alice Coleman, Nan Day, Phyllis Dixon, Mary Jane Kirtz, Pauline Kittlaus, Joseph Meis, Anita Siegmund, Betty Sims, Joanna Werner, and Mary Wind. **Celebrating ten years** were Margaret Abbott, Neva Buss, Barbara Cook, Frank Enger, Arden Fisher, Wilma Hanks, Lorraine Hatscher, Anne Heisler, Marian Herr, Helen Hilliker, Dorothy Hitt, Pauline Jaworski, Laverda McDonald, Gloria Mills, Beatrice Mosher, Joan Murphy, Dorothy Olson, Gertrude Pappert, Sue Reisel, Laura Riganti, Vicki Roberson, Susan Schreiber, Judy Shinkle, Kay Sofian, Warren Tabachik, Sallie Wood.

The Garden is deeply grateful to all of its volunteers, and is delighted to be able to say "thank you" to all of those celebrating anniversaries this year.

From the Garden Gate Shop

"Choose Your Own" Bulbs

This fall you can have a collection of flowering bulbs tailored to your landscape. The Shop has catalogues and order blanks and the bulbs will be shipped direct to your home.

For more information call 577-5152.

A New Buyer

With the retirement of Inez Bender, a longtime buyer for the Garden Gate Shop, the staff welcomes new buyer Lynn Yaeger.

Christmas in July

Come by the Shop for a preview of the exciting Holiday season coming up. While you're there, enjoy the bright summer colors of casual table settings, patio furnishings, paper ware, and garden statuary, and place your order for the 1992 limited edition Brockman Musical Greenhouse.

Donella Meadows Visits the Garden

On May 29, 1992, Donella H. Meadows visited the Garden to deliver a lecture and sign copies of her book *Beyond The Limits*, Chelsea Green Publishing. Dr. Meadows, who coauthored the book with Dr. Dennis L. Meadows and Dr. Jorgen Randers, is an adjunct professor at Dartmouth College in the Environmental Studies Program. She has written or cowritten nine books and writes a nationally syndicated newspaper column, "The Global Citizen." *Beyond the Limits* is a sequel to the international best seller *The Limits to Growth*. It makes powerful arguments for the urgency of reducing population growth and material consumption to avoid global collapse. The book is available in the Garden Gate Shop, $19.95.

Flower Festival Honors Stephen Wolff

On Saturday, April 25, 1992, The Episcopal Diocese of Missouri honored Stephen Wolff of the Garden's Horticulture Division at a service celebrating the annual Flower Festival. Henry Shaw provided for a special service in honor of plants in his Will in 1889, and every year the Garden presents hundreds of blooms to decorate the Christ Church Cathedral.

For 22 years Stephen Wolff has supervised the preparation of the beautiful flowers donated to the church in memory of Henry Shaw.

Mr. Wolff began his career as an intern at the Garden 24 years ago during his last semester at Lutheran High School South. He continued to work at the Garden while earning his degree in horticulture from Meramec Community College in Kirkwood. Today he is the production horticulturist at the Garden.

Dr. Mark J. Plotkin, vice president of plant conservation for Conservation International, visited the Garden in May to consult the herbarium. Dr. Plotkin is internationally recognized for his research on rain forests and their contributions to medicine. He was visiting St. Louis to deliver The Jane and Whitney Harris Ecology Lecture at the International Center for Tropical Ecology, University of Missouri-St. Louis.

A meeting of the U.S. editorial committee for the Flora of China *project was held at the Garden April 10, 1992. Shown clockwise, from top: Dr. Ihsan Al-Shehbaz, MBG; Orbelia Robinson, California Academy of Sciences; Bryan Dutton, Arnold Arboretum; Dr. Bruce Bartholomew, California Academy of Sciences; Dr. Nancy Morin, MBG; Dr. Laurence Skog, Smithsonian Institution; Michael Gilbert, MBG; Dr. Peter H. Raven, MBG; Dr. William Tai, MBG. Attending but not pictured: Dr. David Boufford, Harvard University.*

On April 13, 1992, the Garden hosted visitors from the University of Leiden to discuss matters of mutual concern. From left: Dr. Peter Baas, University of Leiden; Dr. Peter H. Raven and Dr. W.D. Stevens, MBG; Dr. Marco Roos, University of Leiden; and Dr. Ihsan Al-Shehbaz, MBG.

PROFILE Peter Goldblatt, Ph.D., B.A. Krukoff Curator of African Botany

THE Iridaceae (Iris) family contains many beautiful flowering plants familiar to St. Louisans: iris, gladiolus, crocus, freesia, among others. But the plant family also contains many exotic plants. Garden scientist Peter Goldblatt studies the Iridaceae of Africa, where two-thirds of the family's 1,700 plant species grow.

After receiving his Ph.D. from the University of Cape Town in 1970, Goldblatt, a native of South Africa, came to the Garden in 1972, one of the first group of botanists recruited by Peter Raven. Though his research up to that time had concentrated on Iridaceae, he was actually hired to study poppies in the Middle East. He completed that study in three years and returned to his study of the Iris family.

In 1975 Goldblatt was named B.A. Krukoff Curator of African Botany. Among North American botanical institutions, the Garden is the center for the study of African botany. The Garden's herbarium houses the largest collection of African plant specimens in North America. The nucleus of the Garden's herbarium the Bernhardi collection acquired by George Engelmann in 1857, had many European and African specimens collected during the late 18th and early 19th centuries, giving the current herbarium an uncommonly old base in African plants for a North American herbarium.

The Garden is actively involved in all aspects of African botany and is an active member of Association for the Taxonomic Study of the Flora of Tropical Africa (AETFAT). In 1985, the Missouri Botanical Garden hosted the organization's meeting, held every five years. Goldblatt served as Secretary-General of AETFAT from 1982-1985.

Goldblatt says he was interested in Iridaceae even before he became a botanist. "The plants of the Iridaceae were not particularly well understood in Africa, and I used to like to grow them," he says. "I figured out that there was a lot of misunderstanding and confusion about the family, and it eventually led to a career-long research interest."

The family is important economically. While many of the plants of the Iridaceae family are ornamentals—it is probably the most important single plant family in the cut-flower industry—some of the plants are used for other purposes. Saffron, for instance, comes from the stigma of a species of crocus. In the Middle East underground portions of crocus are eaten as a food. And in Africa gladiolus is frequently used for a variety of ailments.

To more effectively study the plants, Goldblatt maintains an extensive living collection of Iridaceae in the Garden's greenhouses. "The Garden is a very nice place to work because of the beauty of the surroundings," says Goldblatt. "It is very stimulating because of all the research activities that go on here. I think it is the most stimulating botanical institution in the world to work for."

On May 27, 1992, Peter Goldblatt was honored at a Garden staff meeting for 20 years of service.—Editor

From left: Judith Bramble, Tracy Kay, Ron Zimmerman, Larry DeBuhr, Gary Mullins, Cheryl Charles, Jack Padelino.

Nature Center Advisory Board Meets

A group of five distinguished experts in environmental education held its first meeting at the Garden this spring to develop long range plans for 1993 programs at the Litzsinger Ecology Center. The Advisory Board met with Dr. Larry DeBuhr, director of education, and Dr. Judith Bramble, a teacher at St. Louis University, who is helping the Garden with long range planning for the Center.

The Ecology Center is a private, not-for-profit facility administered by the Garden. (See the *Bulletin*, January-February 1992.) This summer and fall the Garden is offering limited class opportunities at the Center, and the full range of programs will begin in 1993. Dr. Bramble will visit the facilities supervised by Board members and other nature centers this summer, and the Advisory Board will return for meetings in St. Louis in the fall. Board members include Dr. Cheryl Charles, executive director of Project WILD; Tracy R. Kay, city naturalist and director of the Rye Nature Center in Rye, New York; Dr. Gary W. Mullins, associate professor of natural resources at The Ohio State University; John (Jack) Padelino, president of the Pocono Environmental Education Center; and Ron Zimmerman, director of the Schmeeckle Reserve at the University of Wisconsin at Stevens Point.

''We are delighted to have the assistance of this eminent group,'' said Dr. Larry DeBuhr. ''Their experience and insight will help us to offer programs of depth and scope at this exciting new facility.''

Guides Offer Tailor-Made Tours

Groups of all ages and interests take advantage of the expertise of the Garden Guides. On Thursday, April 9, a group from the Soule Center and OASIS (pictured above) enjoyed a tour of the magnificent sculpture at the Garden, led by Mary Jane Kirtz.

The Garden Guides have been active since 1968. The docents spend hours each month learning about the various aspects of the Garden. Special tours can be arranged on a wide variety of topics, including the Japanese Garden, the life of Henry Shaw, and trees at the Garden.

Reservations are required for special tour groups and must be made four weeks in advance by calling (314) 577-5140. Public tours are available every Tuesday, Saturday and Sunday at 1 p.m.

ECO-ACT Is Part of Earth Tech '92

The Garden's ECO-ACT Program was featured ''Earth Tech '92,'' a two-hour international television event aired on Friday, June 5, 1992 on KETC, St. Louis' PBS station. The program focused on the Environmental Summit in Rio de Janeiro.

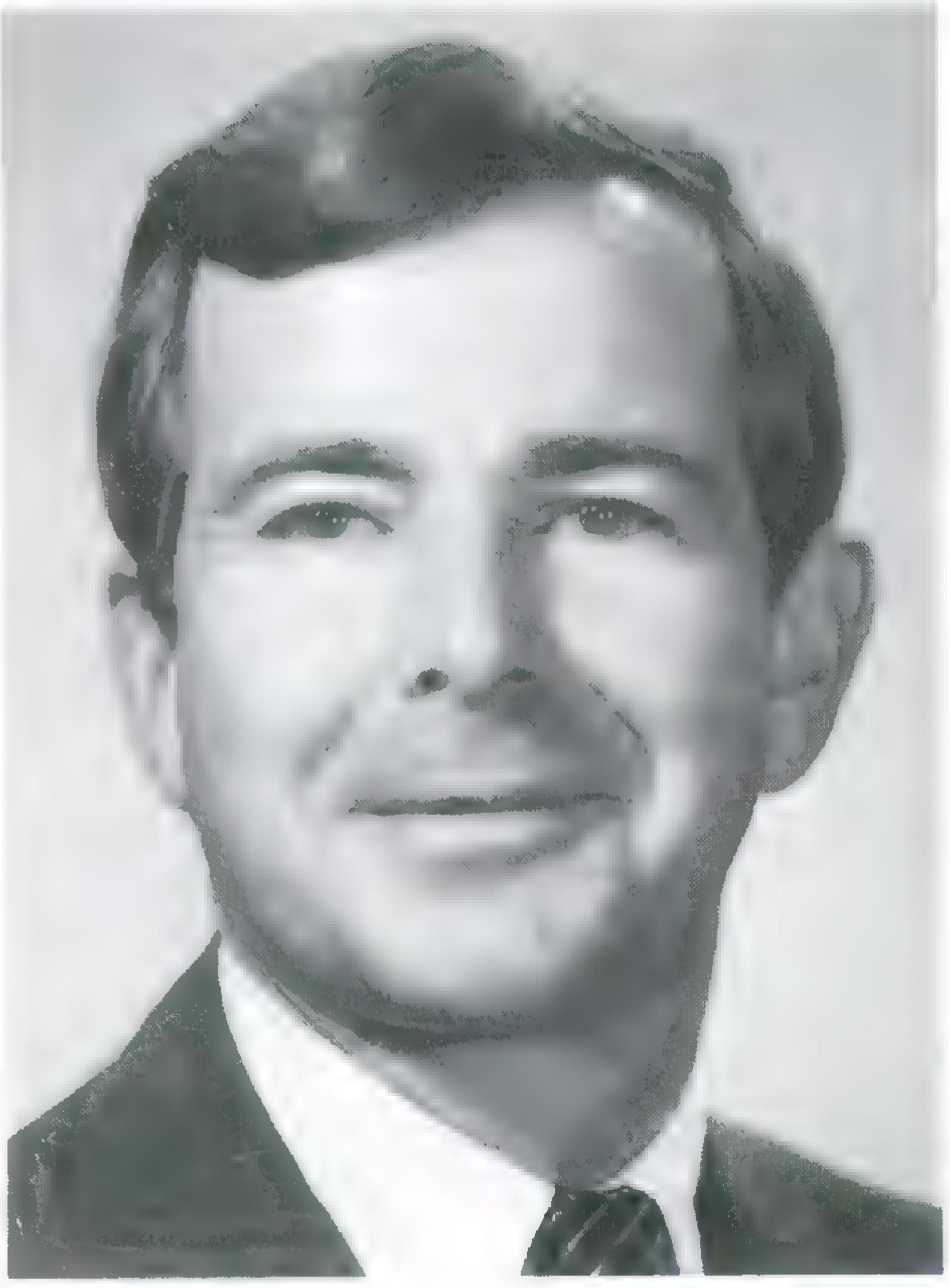
Emphasizing the case for individual action, the documentary examined wetlands preservation, indigenous peoples, environmental entrepreneurs, urban challenges, reforestation and education. The segment on ECO-ACT was filmed at the Garden earlier this spring. The filmmakers spent a day filming at the Shaw Arboretum, and included a class taught by two students from Maplewood/Richmond Heights High School.

They interviewed Garden staff members and ECO-ACT students.

ECO-ACT is the innovative program in environmental education and leadership training developed at the Missouri Botanical Garden. High school students from throughout the community spend a year learning about environmental science and teaching strategies, then use their skills to teach younger students and to carry out conservation projects.

Anchored by Scott Simon, host of National Public Radio's Weekend Edition: Saturday, Earth Tech '92 was the result of international collaboration led by Thirteen/WNET, and included ABC Australia, Antenne-2 of France, KTN of Kenya, NHK of Japan, TV Ontario of Canada, the U.N. Department of Public Information and VIDEOCIENCIA of Brazil.

Trustee Profile



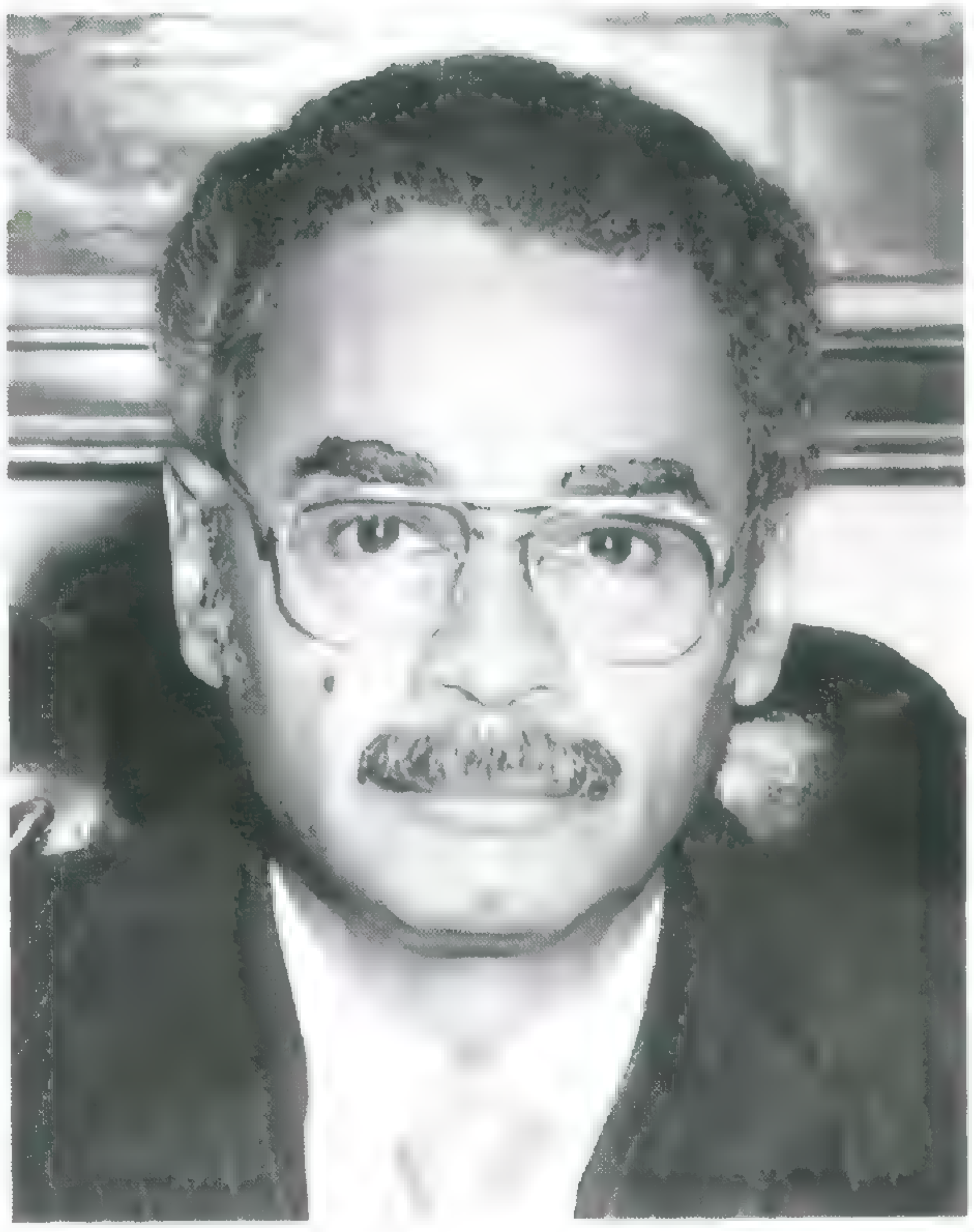
Parker B. Condie

This past spring the Board of Trustees elected Parker B. Condie as a Term Trustee. Mr. Condie, a native St. Louisan, was the owner and president of Leppert Roos until his retirement February 15, 1992.

Mr. Condie is a 1963 graduate of Washington University. He has been active in many St. Louis organizations including the Members' Board of the Garden, the Board of Trustees of Villa Duchesne/Oak Hill School, the Clayton Rotary Club, the Children's Christmas Foundation, Our Lady of Grace Child Center, the American Cancer Association, the Order of the Veiled Prophet and the St. Louis Zoo Association. He currently serves as a director of the Municipal Theatre Association of St. Louis.

"We are delighted to have Mr. Condie on the Board of Trustees," said Dr. Peter Raven. "We look forward to working with him and the Garden will benefit from his lifelong commitment to St. Louis and its institutions."

Mr. Condie and his wife Margot have five children.



Dr. Roy Jerome Williams, Sr. Elected to Subdistrict Commission

The St. Louis Board of Aldermen approved the appointment of Dr. Roy Jerome Williams, Sr. as a Commissioner from the City of St. Louis to the Botanical Garden Subdistrict of the Metropolitan Zoological Park and Museum District.

Dr. Williams is a prominent member of the St. Louis community. He is a founder and co-chairman of the Board of Directors of Gateway National Bank, a director of the St. Louis Urban League, and serves on the executive committee of the St. Louis Symphony Society. He is a former director of the outpatient department at Homer G. Phillips Hospital, a past president of Harris Stowe College Board, and a past member of the State Board of Registration for Healing Arts, the State Board of Education, the St. Louis Board of Police Commissioners, the St. Louis Red Cross, and the Board of Directors of the Regional Commerce and Growth Association.

Dr. Williams is on the staff of St. Luke's Hospital, DePaul Hospital, Bethesda Hospital, and St. Mary's Central Medical Center. He graduated from Morehouse College, earned his M.D. at Meharry Medical College, and did postgraduate work in internal medicine at Homer G. Phillips Hospital in St. Louis. He is in private practice with his sons Dr. Jerome Williams, Jr. and Dr. Wendell N. Williams.

"I have enjoyed the Botanical Garden for the past 50 years," Dr. Williams said, "but I never realized its international reputation. I'm honored to be working with the subdistrict and hope that the garden's activities and displays will be better known and utilized by all segments of the community."

Gift Planning

Garden Offers Gift Annuities

At times donors may be eager to make a significant charitable gift, if they can be assured they will not need those assets in the future. A Garden gift annuity program has been created to respond to these situations. Through gift annuities, donors can make contributions to the Garden and still retain an income from those gifts during their lifetime. The amount of life income that is returned to the donor is based on actuarial tables established by the National Committee on Gift Annuities.

An especially appealing feature of the gift annuity is the fact that it can be used to convert stocks that are not yielding very high returns. The situation arises, many times, in which low-yielding stocks would be too costly to sell because the capital gains tax would be prohibitive. The gift annuity represents an ideal way to convert those stocks to payments that actually increase current income for the donor.

If you are interested in the concept of a life income gift, the Gift Planning Coordinator, Ernestina Short, would be pleased to discuss the possibilities with you. She can be reached at 577-9532.

Graduate Student News

The American Society of Plant Taxonomists has awarded $400 to Neil Snow, a student in the Ph.D. program at Washington University. The funds will be used for a trip to Texas and the southwest to collect specimens of *Leptochloa*, a genus in the grass family.

The Organization for Tropical Studies has selected two Garden students to attend courses in Costa Rica this summer. Neil Snow will attend the Tropical Biodiversity course. Guanghua Zhu, a student in the Ph.D. program at the University of Missouri-St. Louis, will participate in the longer Tropical Biology course. Guanghua grew up in Inner Mongolia and currently studies aroids in the genus *Dracontium*.

Moving? Please Remember To Send Us Your New Address.

To avoid missing any of your membership mailings, you *must* give us your new address at least three weeks *before* you move. Please enclose the mailing label on the back cover of this *Bulletin*, and mail to: Membership Office, Missouri Botanical Garden, P.O. Box 299, St. Louis, MO 63166.

From left: Gilbert Early, Caroline Early, Pauline Pitzman Eades, Peter H. Raven, Jeff DePew, Larry DeBuhr.

Pitzman Fund Celebrates 35th Anniversary

On Wednesday, May 13, 1992 the Garden celebrated the 35th anniversary of the Pitzman Nature Study Program. For the past 35 years the Pitzman Fund has supported education for thousands of children at the Garden in natural history and nature study, through the generous bequest of Mr. Frederick Pitzman.

Pauline Pitzman Eades, sister-in-law of Frederick Pitzman, Caroline Early, daughter of Mrs. Eades and the late Marsh Pitzman, and Gilbert Early, Mrs. Early's husband, were honored at a luncheon with Garden director Dr. Peter H. Raven, Dr. Larry DeBuhr, director of education, and Jeff DePew, instructional coordinator for the Pitzman Nature Study Program.

Many former Pitzman students are now sending their own children to these classes. The program is so popular that it has been expanded from ten summer classes to include four Saturday classes in the fall and spring. The Pitzman Nature Study Program and the Henry Shaw Academy for older children teach youngsters to understand science, nature, and the environment and better enable them to become adults who will help to improve the world we inhabit.

SEACOLOGY FOUNDATION BENEFIT—The Garden hosted the American premiere of the film "Nafanua: Saving the Samoan Rainforest" on May 7, 1992, for the benefit of the Seacology Foundation. Shown at the reception, from left: Tamra Raven; William L. Marre, director of Seacology Foundation; Chip Reay; Dr. Paul Alan Cox, founder of Seacology Foundation; Marcia Kerz, MBG director of development; and W.D. Stevens, MBG director of research. Contributions or requests for information may be sent to the Seacology Foundation, 3707 N. Canyon Road, Suite 2-D, Provo, Utah 84604.

Tributes

MARCH - APRIL 1992

The Tributes published in the May-June Bulletin *were received during January and February 1992. The list was incorrectly dated; we regret the error.*

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continued on next page

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FOUR WEEKENDS IN AUGUST 1992

Festival *of* Festivals

SATURDAY & SUNDAY,

AUGUST 1 & 2

Japanese Festival

The 18th annual Japanese Festival theme "A New Discovery: Japan" highlights modern day Japan with displays, exhibits, and fashion shows. Enjoy dance, a parade, bonsai, ikebana, food and more.

Sponsored by St. Louis Japanese Chamber of Commerce, Japan America Society, Japanese American Citizens' League, Japanese Language School of St. Louis, Japan Society, Suwa Sister City Committee, and the Consul General of Japan-Kansas City.

SATURDAY & SUNDAY,

AUGUST 8 & 9

Greek Festival

Performers and artisans bring the traditional folk dancing, music, food, arts and crafts of Greece to the Garden. View the plants of the Mediterranean in the Shoenberg Temperate House, and relax in the outdoor Taverna.

Sponsored by Assumption Greek Orthodox Church.

SATURDAY & SUNDAY,

AUGUST 15 & 16

Native American Festival

Celebrate the rich cultural heritage, traditions and customs of Native Americans of the midwest with craft demonstrations, games, tribal dances and costumes, plus demonstrations of tools and gardening techniques.

Sponsored by Cahokia Mounds Historical Site and American Indian Center of Mid-America, Inc.

SATURDAY & SUNDAY,

AUGUST 22 & 23

Italian Festival

"Feste D'Italia" will bring the spirit of Italy to the Garden with music, travelogues, bocce ball, folk arts, cooking demonstrations and glorious food.

Sponsored by Civic Italian American Organization (CIAO).

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On the cover: Autumn is a lovely time to enjoy the serenity of the Garden.
—photo by King Schoenfeld

1992 Missouri Botanical Garden.

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The BULLETIN is sent to every Member of the Garden as one of the benefits of membership. For a contribution of as little as $40 per year, Members also are entitled to: free admission to the Garden, Shaw Arboretum, and Tower Grove House; invitations to special events and receptions; announcements of all lectures and classes; discounts in the Garden Gate Shop and for course fees; and the opportunity to travel, domestic and abroad, with other Members. For information, please call (314) 577-5100.

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Comment

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Autumn at the Garden

September and October are wonderful months to visit the Garden. With summer festivities concluded, members can enjoy cooler weather and peaceful surroundings, and gardeners can begin organizing and planning for their autumn activities. Fall is an excellent time to stroll through the Kemper Center for Home Gardening and take advantage of the resources to stimulate new ideas for your home landscape.

The Kemper Center is open from 10 a.m. to 4 p.m. each day and offers all types of helpful information in the care of indoor plants and outdoor gardening.

Mark your calendars now for wonderful weekend events coming up on Friday, October 9 and Sunday, October 11. The weekend will start with a ''Missouri Country Affair'' on Friday evening under the Garden tent, with country music, fiddlers and square dancers, featuring the Nick Nixon Band. An old fashioned country dinner will top off the evening. On Sunday the Garden, working with Missouri growers and artisans, will be the home of the ''Best of Missouri Market.'' Featuring a tent filled with Missouri products for sale, cooking demonstrations in the Center for Home Gardening, bluegrass and country music to set the mood, the day will be a fun-filled family celebration of the best Missouri has to offer (see back cover).

I extend my thanks to you for your continued support of the Garden's efforts and its determination to work with you to improve the environment. We look forward to seeing you here this fall!

Peter H. Raven

SWEET DREAMS—Eleven-year-old Janetta Dillard of the Shaw Neighborhood was the lucky winner of a large chocolate replica of the Ridgway Center in a drawing held on Friday, July 24, to celebrate the 10th anniversary of the Ridgway Center. The confection was designed and donated by Lynn Plotkin, whose store The Chocolate Lady is located on Clayton Road in Ladue.

MISSOURI BOTANICAL
AUG 31 1992
GARDEN LIBRARY

Harriet Baur Spoehrer

1906 – 1992

On July 19, the Missouri Botanical arden lost a dear friend, Mrs. ermann F. Spoehrer. Mrs. Spoehrer as a member of the Garden for ore than 25 years and had served as Trustee since 1985.

''One of the great joys of service s a Garden Trustee has been the pportunity it gave us to work with arriet,'' stated O. Sage Wightman II, President of the Board. ''Our espect and care for her grew with ach year, as did our admiration of er role as one of our community's utstanding philanthropists. It was ruly an honor to know and be spired by Harriet Spoehrer.''

To help others was Mrs. poehrer's greatest interest and a ource of enormous personal satis- ction. For ''little Harriet Baur from outh St. Louis,'' as she often eferred to herself, it was a natural tep to translate her love of people nto contributions that benefitted em.

Mrs. Spoehrer's belief in the Garden's mission led her to make enerous gifts through the years wherever the need was greatest. Her upport helped make possible the Japanese Garden and the renovation f the John S. Lehmann research facility. Spoehrer Plaza, the striking utdoor entry to the Garden's grounds, was named in tribute to her te husband. She was instrumental in the renovation of the Climatron ropical conservatory, a symbol of the Garden to generations of t. Louisans and visitors.

Most recently, Mrs. Spoehrer provided critically needed support advance the Garden's scientific work. With her assistance, the rmation of computer databases on the plants of North America and hina, an area of specialization in which the Garden leads the world, ontinues to progress. Especially significant was her gift enabling the tart-up of a three-year effort to produce a checklist of the 30,000 lants of China, a compact alternative reference to the 25-volume *lora of China* now in progress and an important resource for the ompletion of that massive work.

Mrs. Spoehrer's extensive legacy of good works will continue to trengthen St. Louis for many years to come. She provided substantial ssistance to her alma mater, Washington University, and particularly s Schools of Medicine and Engineering and Applied Science. Also of eep concern to her were Children's Hospital, Central Institute for the eaf, Junior Achievement, the Salvation Army, Paraquad, Rainbow illage, a number of area schools, homeless causes, and more than 50 ther local charitable institutions.

Dr. William H. Danforth, Chancellor Washington University, speaking at Mrs. Spoehrer's memorial service on July 22, noted the ''wonderful thankfulness'' leading her to give, simply because there was good to be done. He concluded, ''Her memory will provide an inspiration as we go from here so that our own lives will be filled with more generosity and more thankfulness.''

Mrs. Robert Tschudy, Mrs. Spoehrer's daughter, has served on the Garden's Executive Board of the Members for the past five years and is carrying forward the family's commitment to and close participation in the Garden.

Reflected Peter H. Raven, the Garden's director, ''On a tangible level, there are many features here to bear witness to Harriet's unfailing friendship. But I, and all who knew her, prefer to keep her alive in our hearts by remembering her shy smile, her unassuming grace, her love of beauty and fun, and her great empathy and compassion. Harriet Spoehrer was a magnificent person and the world is a sadder place for her passing.''

As this issue went to press, we were saddened by the death of Joseph F. Ruwitch, Trustee Emeritus; John K. Wallace, Sr.; and Elmer G. Kiefer. Please see page 20 for an account of their longtime friendship to the Garden.—Editor.

Marshall R. Crosby, assistant director, and Tan Deyan, editor-in-chief, **Science Press,** ***met in May in Beijing to sign an agreement for the two institutions to co-publish the*** **Flora of China,** ***which will contain descriptions and discussions of the approximately 30,000 species of plants that occur in China. The*** **Flora** ***is being written cooperatively by Chinese and foreign botanists and will fill 25 volumes when completed in about ten years.***

PROFILE / *Brian and Brenda Ward*

An International Career

THE historical heart of Henry Shaw's original Garden, from the water lily pools facing the Climatron to the Linnean House, is known today as the "Intensive Area." For the past 18 years the spectacular plantings in this area have been cared for by horticulturists Brian and Brenda Ward, who retired from the Garden staff in August.

The Wards have been at the Garden since 1974. Like Henry Shaw, they are English. Brian, whose brother and uncle also are professional gardeners, trained at the Royal Botanic Gardens, Kew. Brenda grew up on a farm just outside London, where her mother was an accomplished flower gardener. Brian and Brenda met at a Junior Farmers meeting, "the equivalent of your 4-H Clubs." After their marriage in 1954 they went to South Africa, where Brian served as a supervisor for the Johannesburg Parks Department for eight years. One of his responsibilities included care of "The Wilds," a botanical display garden specializing in native South African plants such as proteas.

In 1961 they came to the United States. "My brother was working as a horticulturist at Longview Gardens in New Orleans," Brian said, "and he encouraged me to apply for a job at Hodges Garden in Shreveport, Louisiana. Of course, we were already accustomed to a hot climate! We were there for eight years, then I answered an advertisement for a job here at the Missouri Botanical Garden. I started in June of 1974, under Bob Dingwall, and Brenda came onto the staff the following November."

Brian began at the Garden as supervisor of grounds. "When Alan Godlewski became director of horticulture he had the idea of giving each of us responsibility for particular areas of the Garden," Brian said. "It has worked out very well, I think. Alan was an extraordinarily talented man and it was wonderful to work with him."

The Garden has changed a great deal since 1974. "The Japanese Garden, the Ridgway Center, none of that existed," Brenda said.

"There were only about 80 people on the staff at that time. Today there are over 300. We work with the hosta garden, the scented garden, the Samuels and Heckman Bulb Gardens, Spoehrer Plaza, and of course the camellia collection, the Swift Family Garden including the perennials, and the beds leading up to the Climatron. So much of that is new since we started."

There have been challenges to overcome. "This is one of the most difficult climates in the world for a gardener," Brian said. "The extremely hot, humid summers, the cold winters, and the wide fluctuations of temperature all add up to what we call 'roller coaster weather,' and the heavy clay soils of St. Louis are always a problem. We are always experimenting with new varieties of bulbs and annuals to find things that are hardy in this climate."

Brian has been active as a lecturer in adult education courses at the Garden for many years. He concentrates on annuals, bulbs perennials, and "Planting for Success." "I love teaching," he says, "and I learn a lot from the students."

"Brian and Brenda are just wizards with plants," said Dr. G. Shannon Smith, director of horticulture. "Their dedication to perfection has made us one of the premier display gardens in the world. They have accomplished extraordinary things, from historical plantings to innovative ideas."

Dr. Peter H. Raven, director of the Garden, said, "The contribution of the Wards has enriched the visits of literally millions of people to the Garden through the years. The legacy of beauty and historical excellence they leave will remain with us forever ."

The Wards plan to stay in St. Louis after their retirement. For all of the countless members, staff, friends and visitors to the Garden whose time here has been enriched by knowing the Wards, it is good to know that they will still be a part of our lives. It is impossible to imagine the Garden without them.

Landscape Design Course Offered

On October 5-6, 1992, the Kemper Center for Home Gardening will host the Missouri Federated Garden Clubs' Landscape Design Course I. The complete series of four courses includes a full range of topics from urban planning to community projects to using native plants in your own yard. The courses are intended to teach good landscape practices and environmental values to professionals and homeowners alike. Registration is limited to 70 people.

The course fee is $50.00 for both days, $25 for one day. The course is sponsored by the Federated Garden Clubs of Missouri, the Missouri Landscape Design Critics Council, and the Missouri Botanical Garden in cooperation with the National Council of State Garden Clubs, Inc. You may obtain a brochure and registration information by calling or writing Mrs. W. L. Beaver, Landscape Design School, 1587 Milbridge, Chesterfield, MO 63017, (314) 532-3232.

Above: Pamela Hughes with Daniel Schlafly. At right: Pamela Hughes with her parents, Mary and Bobby Hughes.

Garden Awards First Just Scholarship

PAMELA L. HUGHES, a 1990 graduate of Normandy Senior High School and a junior at Northeast Missouri State University, has been named the first recipient of the Garden's Ernest E. Just Scholarship. Hughes and her parents, Bobby and Mary Hughes, were entertained at a luncheon at the Garden in July.

The scholarship honors prominent African-American scientist Ernest E. Just and was created to inspire and support African-American students who pursue science degrees. Hughes is majoring in biology and plans a career in research on plants and plant diseases. The $5,000 scholarship has been awarded for 1992-93, her junior year, and is renewable for her senior year.

Hughes was chosen by Garden officials, area educators and community representatives on the basis of her academic record, extracurricular activities, citizenship, and character. Among her achievements are three summers as an INROADS intern, working in Monsanto Company research laboratories. She was also one of eight students selected for the prestigious 1992 Minorities in Marine Sciences Undergraduate Program at the Shannon Point Marine Center in Anacortes, Washington. She has been active at NMSU in the Unique Ensemble Gospel Choir and the Association of Black Collegians.

Dr. Just (1883-1941) was a magna cum laude graduate of Dartmouth College and a member of Phi Beta Kappa. As a scientist at Howard University, he devoted his life to the study of cell structure and function. He wrote two books, including *The Biology of the Cell Surface*, published in 1939, and more than 60 scientific papers. In 1915 he was awarded the NAACP's Springarn Medal for advancing the progress of African-Americans.

"Tomorrow's scientists are being educated in today's world," said Dr. Peter H. Raven, director of the Garden. "The Garden wants to give to the St. Louis community something that has a positive effect on our hometown and the world. This scholarship helps Pamela move toward becoming a professional within the scientific community."

The Ernest E. Just Scholarship is supported by funds from Daniel and Adelaide Schlafly. Those interested in more information on the Just Scholarship should write to the Scholarship Committee, Education Department, Missouri Botanical Garden, P.O. Box 299, St. Louis, Missouri 63166-0299 or call (314) 577-5140.

Chinese Institute and MBG Become Sister-Institutions

The Institute of Botany, Chinese Academy of Sciences, in Beijing and the Missouri Botanical Garden became sister-institutions on July 2, 1992 at a signing ceremony held at the Institute. This agreement was made in recognition of 12 years of fruitful collaboration between the two institutions.

The Institute has one of the most important herbaria in China and is associated with the Beijing Botanical Garden. It also includes the Open Laboratory of Systematic and Evolutionary Botany, called an "open laboratory" because it encourages research work done by foreign collaborators. Dr. Peter H. Raven is honorary director of the open laboratory.

The Institute is a major participant in the *Flora of China* project, and publishes the *Flora Reipublicae Popularis Sinicae* series on which *Flora of China* is based. Many botanists from the Institute have visited Missouri Botanical Garden to carry out collaborative research projects, and Garden researchers have joined Institute botanists on expeditions in China to collect both vascular plants and mosses.

The agreement forms the basis for collaboration in studies in biodiversity, conservation, biology, and floras, for organizing meetings, training courses, and opportunities for training of graduate students in botany, development of a computerized database on the plants of China, and preparation of a flora of the bryophytes of China. The institutions also agreed to enhance exchange of library and herbarium materials, and living material. The signing was covered by many Chinese news agencies and footage of the ceremony was aired on network news throughout the country.

Volunteer Evening

ON MAY 26, 1992, the Garden paid tribute to all of the volunteers whose efforts make the Garden what it is today. Director Peter H. Raven said, "The volunteers chosen by the recognition committee this year are an active group of people with great team spirit and we are very happy to call attention to their work this evening."

The **Special Achievement** award honors volunteers who have performed critically needed research or a special project for a department. This year **Sonia Chetta** received the Special Achievement award for her work as chairman of the Urban Gardening Fair. She arranged for speakers, organized the subcommittees to oversee displays, entries, judges and youth activities. Sonia also recruited and coordinated the efforts of almost 200 volunteers for the Fair. In addition to her work as a Master Gardener, she serves as a dedicated and creative Volunteer Instructor.

The award for **Extra Service Hours** honors the volunteer who has given time above and beyond their normal volunteer commitment. **Georgene Jenkins** was recognized this year for her work as a tour guide in Tower Grove House, where she has been a volunteer since 1985. Georgene has always come on short notice to aid the staff when help was in short supply, a particularly valuable contribution when dealing with the public.

The **Commitment Award** pays tribute to volunteers who come on a regular and faithful basis each week throughout the year, conscientiously performing tasks that often are not inherently rewarding. This year not only was there a tie, there was a tie for two pairs of volunteers. **Jane Thomas and Patrick Kegan** work in the Shoenberg Conservation Center of the Library two days each week. Since they are working on a grant schedule, they stay until 5:00 p.m. or even come in three days a week if necessary, consistently producing work of the highest quality. The second Commitment Award went to **Marion and Ethel Herr**, twin sisters who work in the Development Office. Marion and Ethel keep the Matching Gifts Program running smoothly and also team up for the huge task of compiling, editing and proofreading the bi-monthly Tributes list for the *Bulletin*. "The Twins," as they are affectionately known, also bring their gift of humor and grace to the staff.

The **Organization Award** honors groups that make an outstanding contribution, donate many hours or demonstrate outstanding commitment. Since 1983 the **Master Gardeners** have been a priceless asset to the Garden. They have been involved in an incredible range of educational activities, including the Urban Gardening Fair, the Spring Gardening Fair, the School Partnership Program, Soule Center programs, Plant Clinics, the Answer Service and, since 1991, the staffing of the Kemper Center for Home Gardening with receptionists, Plant Doctors and Saturday demonstrations. Their dedication extends to the new Master Composter Program, extending their contribution and influence throughout the community.

Dr. Raven said, "In 1991 751 volunteers contributed 79,172 hours to provide essential services to the Garden. Your enthusiasm and hard work make it possible for the Garden to fulfill its mission of service to the community through research, education and display, and tonight while we honor these individuals and their very special contributions, we also pay tribute to each and every one of you. Thank you all, so very much."

Honorees pictured above left, left to right: Patrick Kegan; Sonia Chetta; Jane Thomas; Jeanne McGilligan, volunteer coordinator; Peter H. Raven, director; Georgene Jenkins; Marion Herr; Ethel Herr.

Master Gardeners, left to right: Front row: Peter H. Raven, Rienette Diller, Jean Toenjes, Kathy Glass, Sonia Chetta, Sue Reisel, Rosemary Murphy, Dr. Stephen Cline. Row 2: Ann Case, Eleanor Sauer, Isabelle Morris, Albert Hirson, Don Neal, Linda Whitten, Maxine Schuler, Ruth Jonas, Norma Geisler, Glenn Kopp. Row 3: Frank Arnoldy, Marshall Magner, Don Culberson, Si Dietz, Christine Kurtz-Fuerhoff, Ellen Mayer. Back row: Keith Heerlein, Jeanne McGilligan, Bill Cassilly, Joseph Meis, Herman Easterly, Rhonda Porche-Sorbet, Billie Beyer, Mary Ely.

Ecology Center Takes Shape

UNSEEN changes are taking place at 34 quiet acres of prairie, stream, and bottom land forest in Ladue. The area is slowly being converted into an environmental education center that will help teach the children of St. Louis about the wonders of the natural world, how to study them, and how to preserve them.

The Missouri Botanical Garden is working closely with the Litzsinger Road Ecology Foundation, formed by a private anonymous donor, to design and implement the Litzsinger Ecology Center in the heart of metropolitan St. Louis. This educational center will become an important focal point for the Garden's outdoor education programs and for the future development of resources and programs that will serve the region and the nation as a model for environmental studies and education.

In February an advisory committee of outstanding environmental educators was assembled to begin program planning. (See July/August, 1992 *Bulletin*.) Dr. Judith Bramble, a teacher at St. Louis University, was hired to help coordinate this advisory committee and to visit model environmental education programs at other sites in the United States. This fall, the advisory committee will meet again in St. Louis, and a formal program plan for the Litzsinger Road Ecology Center will be drawn up.

In the meantime, Dr. Clifford Ochs, a St. Louis biologist, has begun a biosurvey at the Litzsinger site. By the end of the year, a list of the plants, birds, mammals, and insects will be assembled. The water quality of the stream, core samples of the oldest trees, and geological studies of the area will be assembled. All of the information gathered during this biosurvey will be useful for the development of educational programs and for comparisons of the biology of the site in future years.

A minimal amount of construction work has occurred at the site. The road into the area was relocated and a small parking area will be added. The road and parking area will be landscaped so as not to be visible by people driving on Litzsinger Road. Both the road and parking area are located in an adjacent pasture, and have not been constructed in the nearby forest.

At the same time, an old log cabin was renovated to serve as a staging area for school children, teachers, or individual students conducting research projects at the Litzsinger Road Ecology Center. A small deck was added to the back of the cabin, and a wooden walkway into the forest was built to allow for wheelchair accessibility. The cabin will provide shelter in the event of bad weather and will serve as a storage site for instructional equipment. Restroom facilities for girls and boys were also added.

Students visiting the Center in July.

Although the nature of the educational programs at the Litzsinger Road Ecology Center will not be finalized until the end of the year, some educational programs were offered during the summer and fall. In July, a series of week-long ecology camps was held. Nearly 80 children participated and learned about nature, plants and animals, and how the ecosystem works. Some of the instruction was provided at the Garden and some at the Litzsinger Road Ecology Center. This fall the Garden is using the Litzsinger Road Ecology Center to introduce the ECO-Inquiry program to the St. Louis area. ECO-Inquiry is an instructional program developed by the Center for Ecosystem Studies in New York. The Missouri Botanical Garden is serving as one of several institutions to test the program with school children and to train teachers about how to use it.

The Litzsinger Road Ecology Center, which is made possible with the support provided by the Litzsinger Road Ecology Foundation, will serve the St. Louis community as an important educational resource. In the future, it will allow the Garden to educate thousands of children and adults, and will undoubtedly serve as a focal point for outdoor environmental education in Missouri and the nation.

Garden Hosts International Meeting

The Missouri Botanical Garden served as host to the Fifth International Symposium of the International Organization of Plant Biosystematists (IOPB) on June 11-15, 1992. Some 260 scientists from 19 countries attended the meeting held at the Hyatt Regency Hotel at Union Station. The Symposium was supported by generous grants from the Monsanto Company and the Mallinckrodt Specialty Chemical Company.

The opening address, ''Biosystematics 1992,'' was presented by Dr. Peter H. Raven, director of the Garden and incoming president of the IOPB. One of the highlights of the event was a cordial evening reception at the Garden. Many of those attending the meeting also participated in field trips to the Garden, the Arboretum, the Ozarks, southern Illinois, and the Rocky Mountains.

Many of the talks and posters presented at the meeting described exciting new results that combine traditional methods of studying plants with recently developed molecular techniques involving DNA and proteins, as well as new statistical and theoretical methods. What is emerging from work presented at the meeting is a profound new understanding of how plants are related and how they evolve and interact with other organisms. The meeting was a great opportunity for scientists from many countries to interact and share knowledge, which is the purpose of the IOPB.

Horticulture in Missouri

How to Save Endangered Species

I wish there were a recipe or a formula for saving endangered plant species. If there were, and we had the will and resources, we could simply follow the protocol, step by step, and get about our work ensuring the future of our threatened native flora. But, no such recipe or formula exists. The strategy for preserving a tiny ephemeral annual plant will, by necessity, differ from the plan for saving a tree that seldom sets seed. We would like to store seeds of all our endangered species as insurance in case the few living plants die or are destroyed; but some species do not produce seed, or some have seed that will not tolerate storage. How can we bring a species into cultivation when we don't even know how to germinate its seed, or what kind of conditions it needs to live? So, we must develop a plan of action for each individual species, learn as much as we can, and apply the knowledge as we go along. We have embarked upon a great experiment, and we race against the clock to do our best.

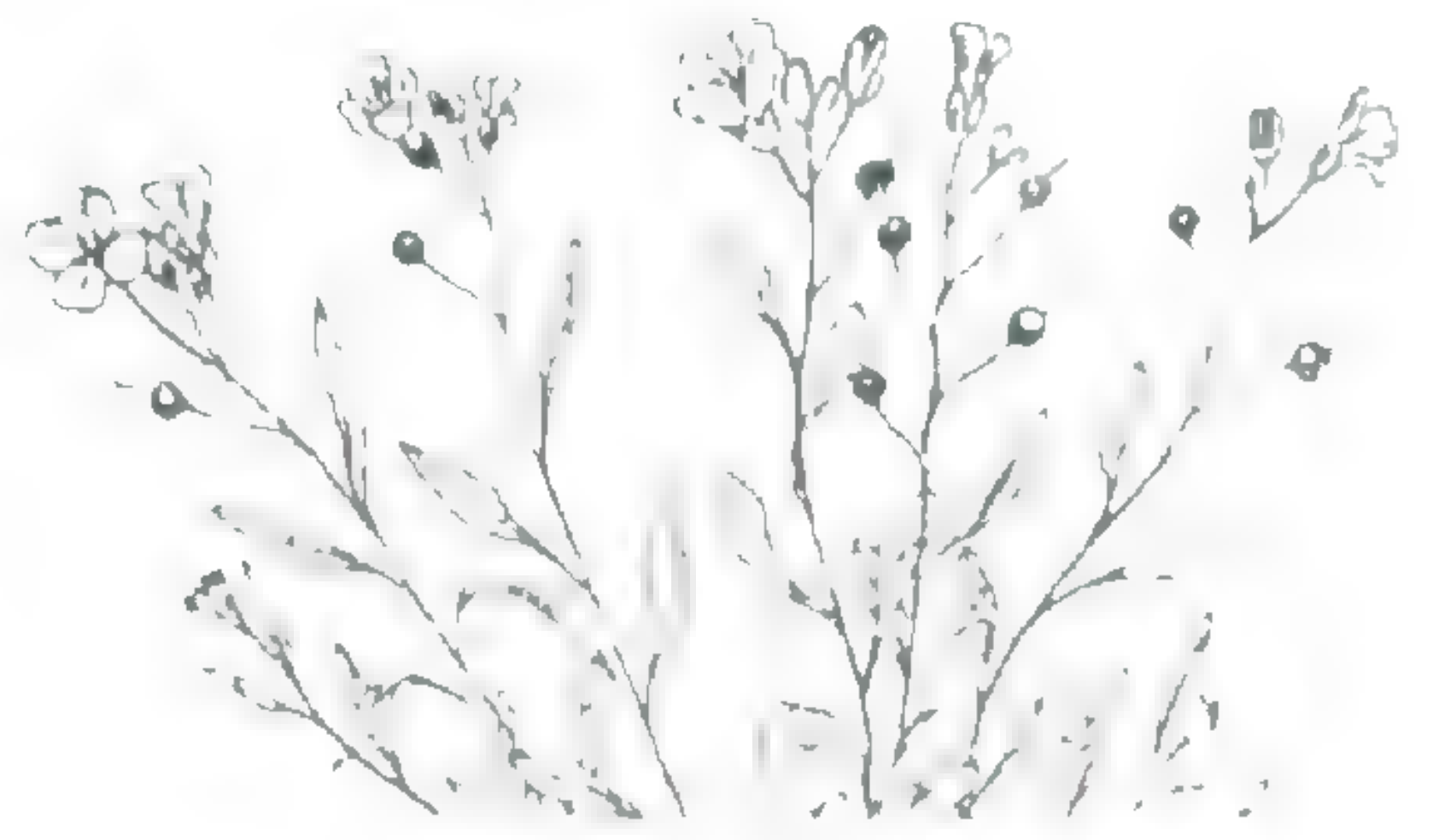
The Center for Plant Conservation estimates that about one-fifth of our native plant species are of conservation concern in that they are experiencing some type of threat; 800 species could become extinct within the next ten years unless we intervene and work to save them. When the Missouri Botanical Garden joined CPC, we agreed to work with other gardens and arboreta to meet the challenge of saving our threatened native plants. Now the Mellon Foundation has provided a way to help us meet that challenge—and you or your organization can be part of it, too.

The Mellon Foundation will match each $5000 gift, and the total will be placed in an endowment fund for a particular endangered species. Just like other endowments, the principle will remain intact, and the interest will be used to fund conservation projects for that species. The Garden is currently working with sixteen endangered species from our region, but only three have been endowed. Several of the thirteen species that need endowments are profiled below.

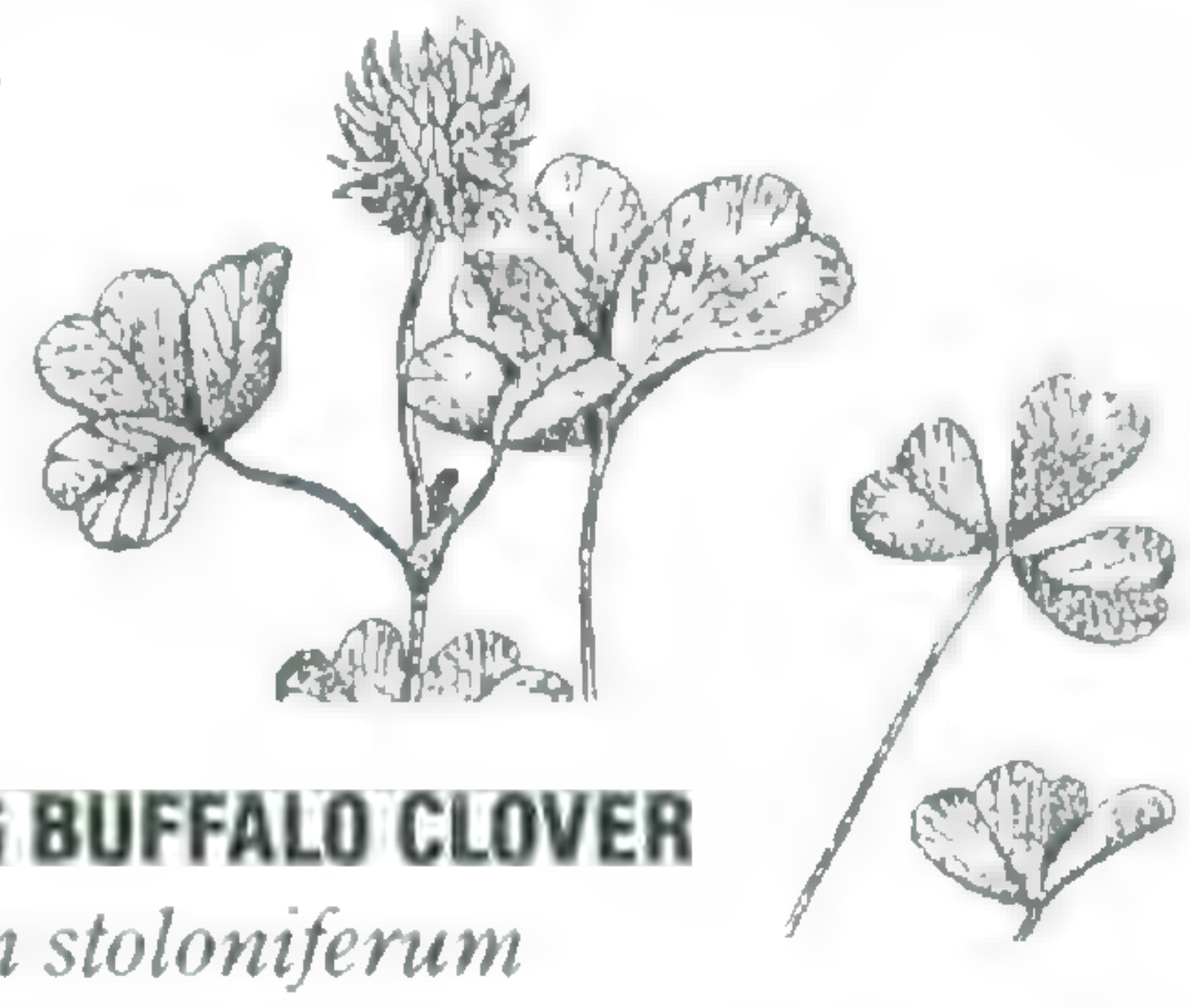
MISSOURI BLADDERPOD

Lesquerella filiformia

The Missouri bladderpod is the only plant species that occurs exclusively in the State of Missouri. It is also federally listed as an Endangered Species. This tiny winter annual lives on limestone glades in three counties in southwestern Missouri. It has an unusually life history that permits the plants to tolerate scorching summer heat on limestone glades.



Missouri bladderpod is threatened because its glade habitat is being altered by grazing and the encroachment of trees onto the glades. Missouri Department of Conservation has purchased a glade in order to preserve the species at that site and to experiment with management practices for the glade habitat. Several researchers in Missouri are conducting population, reproductive and seed studies of Missouri bladderpod; the results of their efforts will be applied to the recovery plan for management of the vanishing glade habitats as well. Garden staff are represented on the federal recovery team and are concentrating their efforts on long-term seed storage and public education of this Missouri endemic.



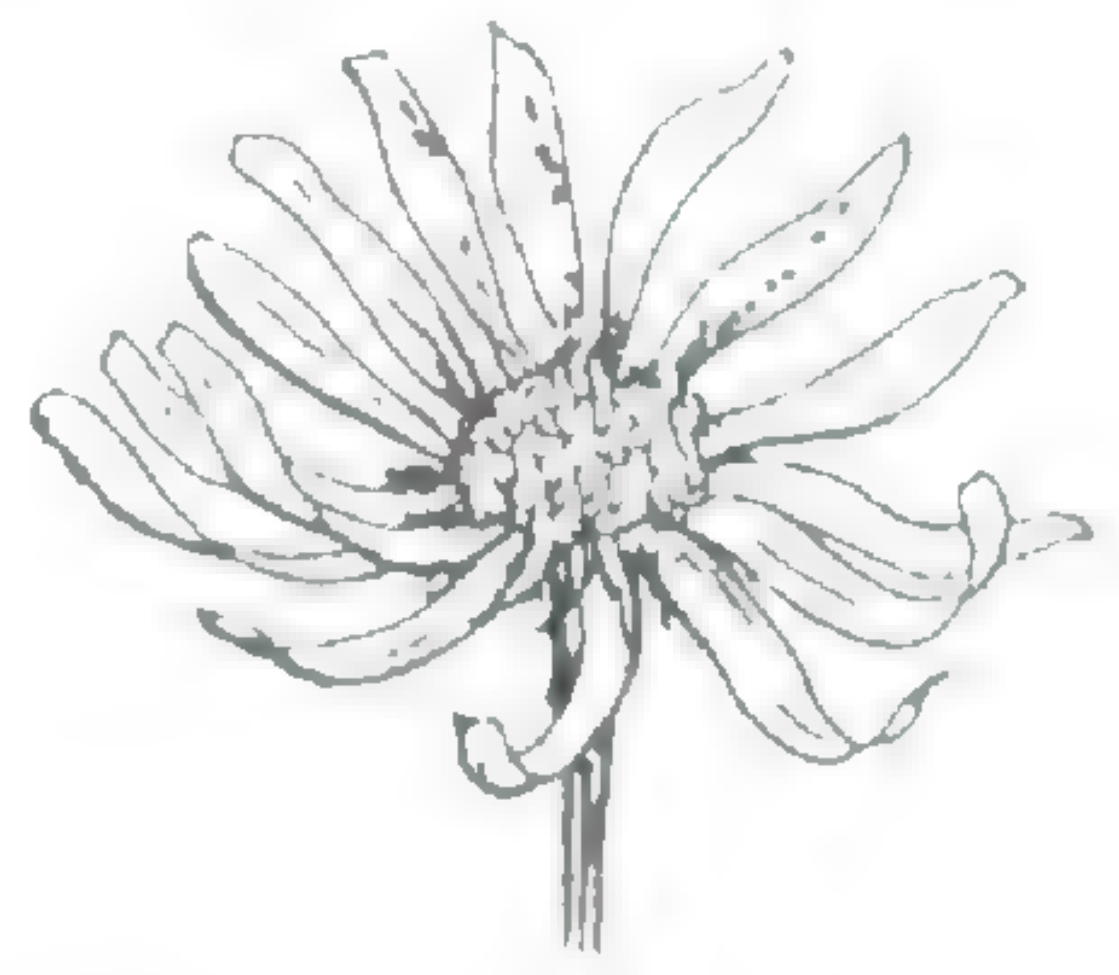
RUNNING BUFFALO CLOVER

Trifolium stoloniferum

We know that running buffalo clover was once widespread in Missouri and other midwestern states, because early European explorers and settlers described this lush clover from areas where buffalo and other herds of large grazing mammals made their annual migration. Today, however, no populations of this federally listed Endangered Species exist in Missouri, and only remnant populations have been found in West Virginia, Kentucky, Ohio and Indiana.

This white-flowered perennial clover "runs" using stems that spread over the soil and root along the stem. By this means many small plants can become established. However, seeds are seldom produced.

Missouri Botanical Garden has been involved in several aspects of the recovery of this species. We have non-destructively sampled plants from throughout the range and are maintaining living populations in cultivation. Genetic analyses have been conducted on all of our plants by researchers at Miami University in Ohio. Results of these tests are helping us determine which populations are more genetically diverse, and thus a priority for conservation efforts. The Garden is also propagating plants for the Missouri Department of Conservation's reintroduction program; running buffalo clover is being planted in sites where it once occurred in Missouri in order to reestablish populations and to learn about their preferred habitat in the state.



TENNESSEE CONEFLOWER

Echinacea tennesseensis

The Tennessee coneflower is an herbaceous perennial that grows on a few limestone glades near Nashville, Tennessee. Their attractive flowering heads with dark pink ray florets are produced in summer. The "echinos" of the scientific name means hedgehog in Greek and aptly describes the spiny cone in the center of the flowering head.

This species has probably never been common, since it is restricted in nature to a small group of limestone glades. Today the species is particularly vulnerable because all the known sites occur within a fourteen-mile radius and are in the pathway of development within the metropolitan Nashville area.

A second threat to the Tennessee coneflower is a biological one: hybridization. This endangered species hybridizes readily with the commonly cultivated species *Echinacea purpurea*. When hybridization occurs, the Tennessee coneflower's own unique compliment of genetic material becomes diluted, and the resulting seed are not representative of the species.

Missouri Botanical Garden has seeds in storage and has been successful at growing plants to reproductive maturity. Some of these can be viewed in the Rock Garden and in the northern extension of the Woodland Garden.

If you want to learn more about our thirteen species, or wish to know how you or your organization could endow an endangered plant, call Claudia Spener at (314) 577-9455.

—Lucile M. McCook, Ph.D.
Horticultural Taxonomist

Center for Plant Conservation

Campaign for the National Collection Is Based on Regional Support

VOLUNTEERISM is alive and well at the Missouri Botanical Garden. Just ask Patty Bush. This longtime supporter of the Garden and a member of the Board of Trustees of the Center for Plant Conservation (CPC) is spearheading a St. Louis-area effort to endow or sponsor 13 endangered plants at the Missouri Botanical Garden, one of the CPC's 25 participating gardens. Patty Bush's efforts are a critical part of helping the CPC meet the terms of a challenge grant issued by the Andrew W. Mellon Foundation.

The CPC, a national organization headquartered at the Missouri Botanical Garden and governed by an independent Board, is dedicated exclusively to conserving rare and endangered plants of the United States. In 1988, the Mellon Foundation pledged $500,000 to the CPC's Plant Conservation Fund, an endowment providing stipends for the National Collection of Endangered Plants, maintained by participating gardens and now numbering more than 400 species. Fulfillment of the challenge grant will increase the Plant Conservation Fund to $1.25 million, allowing the CPC to increase the numbers of plants it can preserve from extinction.

To successfully complete the challenge, the CPC will launch "The Campaign for the National Collection" in September. This nationwide plan involves Trustees and other long-time supporters and volunteers in locating donors to endow the endangered plants at the botanical gardens and arboreta in their respective areas. Mrs. Bush is chairing the campaign segment for Missouri Botanical Garden species, with a local support goal of $65,000 to be raised by the Mellon deadline of June, 1993. The requested endowment gift for each species if $5,000.

"St. Louisans are sensitive to the importance of preserving tropical biodiversity," said Mrs. Bush. "No less important are similar problems closer to home, preserving native flora from extinction. The Mellon challenge grant is a wonderful opportunity to ensure the CPC's vital work."

Added Donald Falk, Executive Director of the CPC, "the locally based nature of this fund raising campaign fits perfectly with our decentralized organizational structure. Our network of participating institutions places the plants under the care of specialists who have knowledge and understanding of the region's flora, and each collection thus has special significance for residents who visit their local institutions.

"We believe that these friends present the most natural pools of potential endowment donors."

Those wishing more information on the CPC endowment campaign for species maintained by the Missouri Botanical Garden may call Claudia Spener at (314) 577-9455.

This is the second in a series of articles about volunteers working to save endangered plants from extinction.—Editor

THIS FALL AT SHAW ARBORETUM

Wetland Update

Five acres of former hayfield in the Brush Creek floodplain at Shaw Arboretum has been reclaimed from agricultural use for the creation of the first phase of the Arboretum's wetland project. Construction of the pond included the formation of water-holding clay berms; two topsoil islands; a deep, open-water portion and extensive shallows.

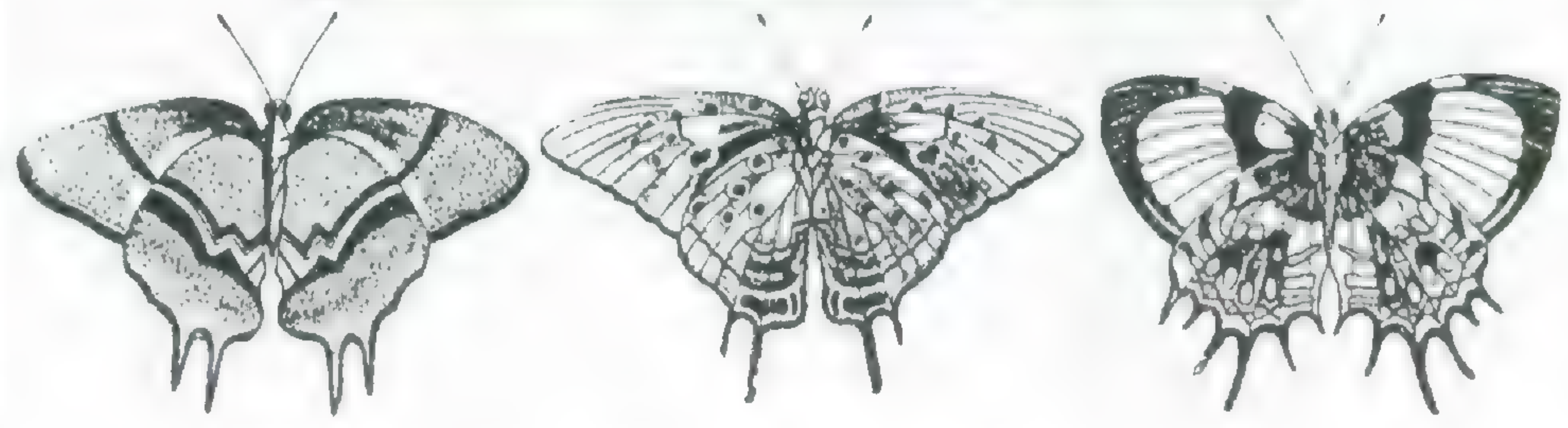
After the abundant rains in spring 1992, the pond water reached within a few inches of its maximum projected depth. Thousands of frogs and salamanders, numerous turtles and uncountable numbers of aquatic insects and snails discovered the pond and began breeding. Oxygen levels have fluctuated widely in the sparsely vegetated pond, so there have been several die-offs, especially of tadpoles. Even so, a walk along the pond's edge reveals numerous young and mature frogs hopping into the water with a squawk, and hundreds of colorful dragonflies flitting among the marsh plants.

As Arboretum naturalist, I am overseeing the planting of the wetland and adjacent watershed. With assistance from other Arboretum staff and about 20 volunteers, approximately 14,000 plants have been transplanted into the shallows and mudflats of the pond, and on the dry slopes and berms surrounding the pond. Over 12,000 marsh plants purchased from a wetland plant nursery were planted during June, including two kinds of bulrush, burreed, arrowleaf, water plantain, wild celery, pickerel weed, sweet flag, spatterdock and several others. Arboretum horticulturist Scott Woodbury propagated locally collected seeds of wet meadow species resulting in one to several hundred plants each of two species of water primrose, two species of cardinal flower, monkey flower, rose mallow, lizardtail, elderberry and swamp milkweed, which are now growing near the new pond. The slope above the south shore of the pond and the berms and spillway were planted with seeds and transplants of over 25 species of prairie grasses and wildflowers. Finally, certain protected spots were planted with bottomland tree species including bald cypress; swamp tupelo, sweetgum; cherry bark oak, Nuttall oak swamp chestnut oak, water oak and willow oak.

There have been setbacks. The most serious has been the expensive loss of many of the purchased marsh plants to the voracious appetites of the Arboretum deer population. The near complete destruction of the planting of pickerel plants was the most expensive loss to these beautiful, but occasionally destructive, animals. Muskrats also caused some damage to the starchy "tubers" of arrowleaf plants. In addition, the wetland, which was planned to be free of fish, now contains bullhead catfish and green sunfish, two highly predaceous and sometimes destructive species. It is not known who put them into the pond. On the other hand, most of the plants have not been eaten and not only have survived but are growing and reproducing. A gap of a few days between visits to the Shaw Arboretum wetland is all that is necessary to see how quickly the new vegetation is becoming established and spreading.

In the future, other portions of the wetland will be designed to support extensive marsh and wet meadow habitats—some permanently wet, others intermittently so. The varied conditions will allow the wetland to support the greatest number of plant and animal species; i.e. increased biodiverity. Additionally, the planned management of the watershed of the wetland as a tall grass prairie-oak savanna complex will enhance the value of Shaw Arboretum as a diverse wildlife and plant habitat in a sea of surrounding agriculture and development.

—James C. Trager, Ph.D.
Arboretum Naturalist



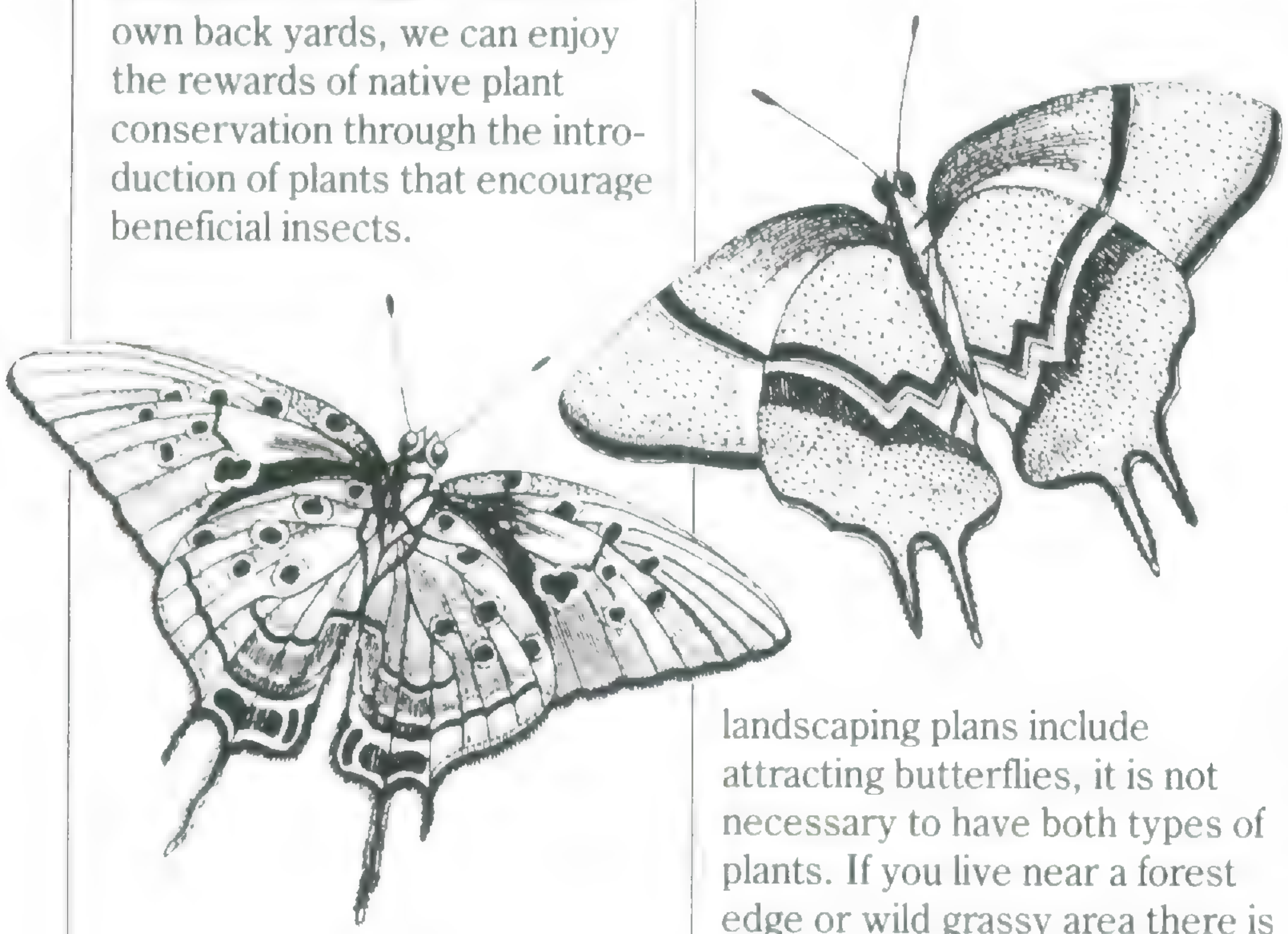
Butterfly Gardening

PARTNERS WITH PLANTS

Watching butterflies is a great pleasure for all who love nature and marvel at the diversity of life. September brings this closer to mind as the first monarch butterflies arrive on their migratory trek to Mexico.

Butterflies not only add color and grace to a garden, they are true partners with plants. Butterflies pollinate flowers and enable some plants to set seeds and produce fruits. Growing plants that specifically attract butterflies has become a popular form of conservation.

As we place more pressure on the land, molding it to fit our needs and altering natural vegetation, insect populations also change. Once we may have seen butterflies close to our homes, but now there are fewer because of the loss of naturalized areas. Conservation efforts and interest in reintroducing native plants helps provide more habitats for wildlife. Even in our own back yards, we can enjoy the rewards of native plant conservation through the introduction of plants that encourage beneficial insects.



MISSOURI BUTTERFLIES

According to *Butterflies and Moths of Missouri*, published by the Department of Conservation, there are about 200 different types of butterflies that visit our state. Among these are the black and yellow swallowtails, which have a distinctive winged tail; the smaller blues and hairstreaks, which display a row of hairs along the wings and characteristically fold these over their backs in an upright position; the white, orange or yellow sulphur butterflies; the skippers, named for their darting dance in and out of vegetation; and the milkweed butterflies, including the familiar orange and black monarchs.

All of these butterflies have a life cycle that includes a leaf-eating caterpillar and a free-flying adult butterfly. Caterpillars eat leaves of certain wild plants and flying adult butterflies are attracted to different plants with nectar producing flowers. If your landscaping plans include attracting butterflies, it is not necessary to have both types of plants. If you live near a forest edge or wild grassy area there is a good chance that the caterpillar food plants are nearby, and simply planting appropriate flowers will attract butterflies to your garden. However, if you live in an urban area, planting both food and nectar plants will allow the insects to complete their life cycle and establish a resident population.

SETTING THE STAGE

Let's face it, most gardeners are in it for the flowers. Fortunately, butterflies can be attracted by providing the right nectar producing blooms. However, the right flowers in the wrong setting will not attract as many visiting insects.

Butterflies don't really care about the style of planting—raised beds, foundation plantings, island plantings. They are attracted to a quiet area out of the wind in a fairly open spot, where sunshine prevails in the morning or early evening. Those are the two times most important for nectar production by flowers and when conditions are best for undisturbed flight.

Most butterfly activity is gauged by the sun. It is used for navigation to food plants and to warm their bodies up after a cool night. The best time to observe butterflies is in the morning when it is still cool but the sun is out. Your garden should be equipped with a few light or dark colored stones prominently grouped, or a sandy area. The cold-blooded insects will visit these spots to warm up and begin stretching and drying their wings for the day's flight. Construct your butterfly garden out of the wind behind a wall, fence, leeward slope or hedge of evergreens.

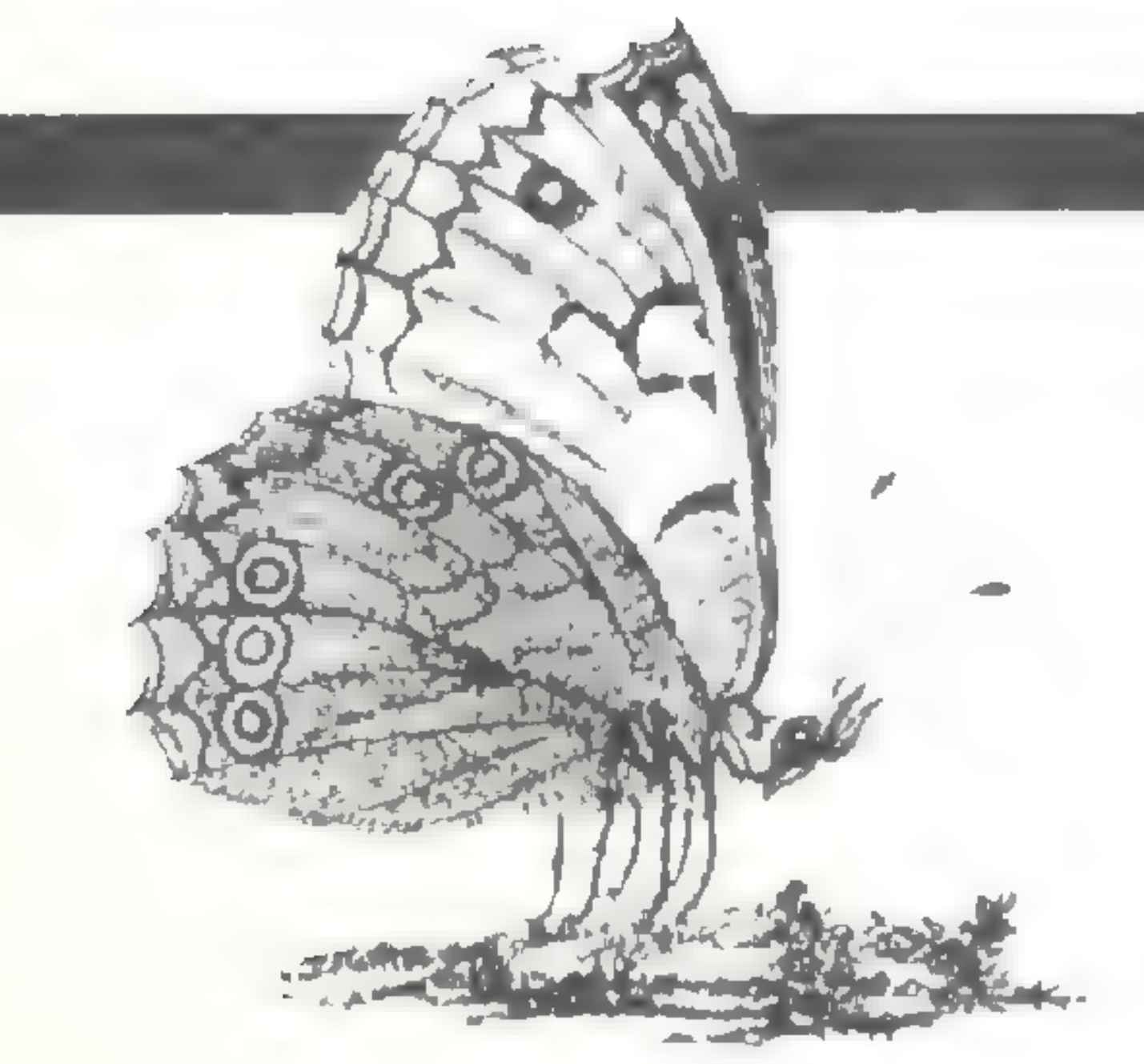
Although it is not essential to provide water for your butterflies, a puddle is often an attraction. Experts suggest that it is not so much the drink as what's in the drink. It is believed that butterflies are after the amino acids and salts in the water. Try sinking a container filled with sand into the ground and keeping it moist, or constructing a seeping watery area.

PLANT SELECTION

There is a wide variety of plants that butterflies enjoy as nectar sources. Good butterfly plants enjoy several traits in common. When looking for these plants, think about flower shape, color and fragrance. Butterflies sip nectar through a long tongue-like tube called a proboscis, which they insert into the nectar producing glands located at the base of the flower between the stamens and petals. Flat flowers are easiest for butterflies to land on, such as New England asters, *Aster novae-angliae;* black-eyed Susans, *Rudbeckia hirta;* coneflowers, *Echinacea purpurea;* and ox-eye daisies, *Chrysanthemum leucanthemum*. Butterfly bush, *Buddleia davidii;* lavender, *Lavandula augustifolia;* and *Lantana* species are all good candidates, with clusters of flowers in a flattened head that makes a convenient landing platform. Other desirable flowering plants are mint, *Mentha* spp.; blazing star, *Liatris spicata;* cosmos, *Cosmos bipinnatus;* phlox, *Phlox paniculata;* fernleaf yarrow, *Achillea filipendulina;* heliotrope, *Heliotropium arborescens;* showy stonecrop, *Sedum spectabile;* French marigold, *Tagetes patula;* zinnia, *Zinnia elegans;* glossy abelia, *Abelia* X *grandiflora;* flowering tobacco, *Nicotiana alata;* Joe-Pye-weed, *Eupatorium* spp.; and goldenrod, *Solidago* spp.

COLOR

Flower color is not a critical factor to attracting butterflies, since most butterflies are attracted by the ultra-violet florescence emitted by each flower that makes the colors appear quite different from what we see. As a general rule, lavender, purple and pink flowers seem to be the most commonly visited, but certain types of butterflies are attracted to other colors.



FRAGRANCE

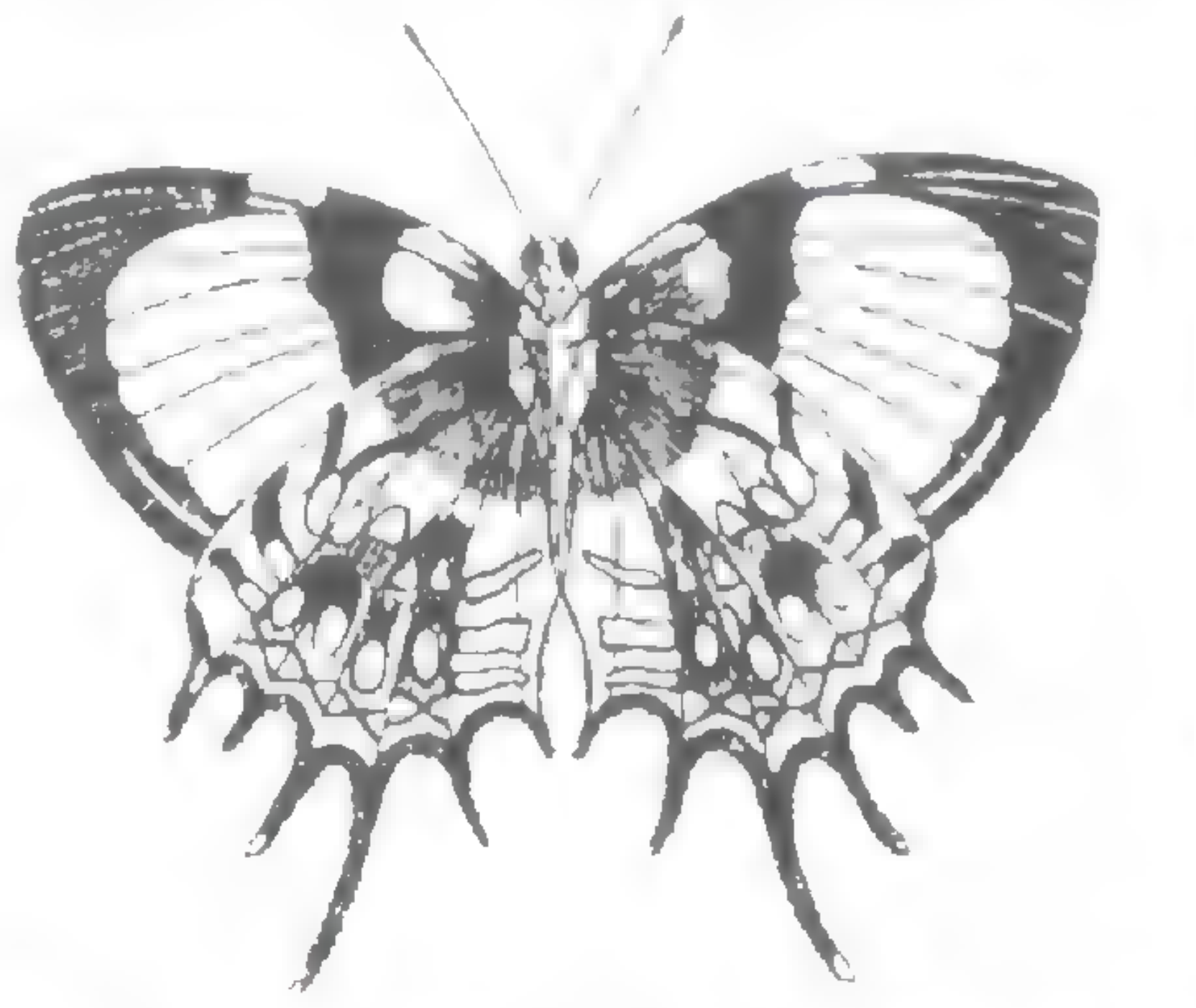
Fragrant plants are back in fashion. We have all but lost this in the landscape with the faint-smelling modern varieties. Butterflies have not lost their taste for fragrance, and given a choice between a heirloom variety and a modern form, they will pick the aromatic one. Try any of the mints, dill, flowering nicotiana, lilac and some of the viburnums. Also see the July/August *Bulletin* for a discussion on fragrant woodies.

Overall, it is best to amass a group of a few types of fragrant plants rather than planting a zinnia here and there. Butterflies will find a plant and concentrate on it if it is in plentiful supply.

SALAD PLANTS

Once you see a butterfly, there is not much time between this stage and the next: a caterpillar with an appetite. Most butterflies live only two to three weeks, and during this period much time is spent on mating and egg laying on a suitable host plant. The eggs will hatch in one to two weeks and the tiny caterpillars will immediately begin to feed on the leaves of the host plant. For the next couple of weeks the caterpillars will eat voraciously and increase up to several thousand times in size-before pupating and emerging as adult butterflies.

If you wish to entertain the entire life cycle of a butterfly, try planting a few select larval host plants as food sources. It will be best to identify the butterflies in your garden and confirm the food plant with a good local reference before planting. Butterflies are finicky about this. Common food plants might be: milkweed, willows, violets, parsley, carrot, dill, parsnip, snapdragon, thistle, nettle, hackberry, cherry, toadflax, and plantain. Obviously, these plants are not prime flowering plants, but consider the conservation effort and the pleasure you could have at discovering emerging butterflies in your garden.



—Steven D. Cline, Ph.D.
Manager, Kemper Center for Home Gardening

Timely Tips from the Answer Service

Do you have a plant question? Call the Horticultural Answer Service, Monday through Saturday, 9 a.m. to noon, at **577-5143.**

September Tips

- Cuttings of annuals can be taken now to provide vigorous plants for overwintering.
- Except tulips, spring bulbs may be planted as soon as they are available. Tulips should be kept cool until planting in late October.
- Begin readying houseplants for winter indoors. Prune back rampant growth and protruding roots. Check for pests and treat if necessary. Houseplants should be brought indoors at least one month before the heat is usually turned on.
- Poinsettias can be forced into bloom for Christmas if they are moved indoors now to a sunny windowsill. Each night, however, they must be given 14 hours of uninterrupted darkness. Continue this treatment through November.
- Divide peonies now. Replant in a sunny site and avoid planting deeply.
- Lift gladiolus when their leaves yellow. Cure in an airy place until dry.

Master Composter
Hotline: 314/577-9555

- Harvest herbs now to freeze or dry for winter use.
- Begin fall seeding or sodding of cool season grasses. Seedbeds should be raked, dethatched or core-aerified, fertilized and seeded. Keep newly planted lawn areas moist, but not wet.
- Lawns may be topdressed with screened compost or other organic soil amendments now. This is best done after aerifying.
- Autumn is a good time to add manure, compost or leaf mold to garden soils for increasing organic matter content.

October Tips

- Plant spring bulbs among hostas, ferns, daylilies or ground covers. As these plants grow in the spring they will hide the dying bulb foliage.
- For best bloom, Christmas cactus, potted azaleas and kalanchoe may be left outdoors until night temperatures drop to about 40 degrees Fahrenheit.
- Cannas and dahlias can be dug when frost nips their foliage. Allow the plants to dry under cover in an airy, frost-free place-before storage.
- Spring bulbs for forcing can be potted up now and stored in a cool, frost-free place until it is time to bring indoors, usually 12 to 15 weeks.
- Plant tulips now.
- Harvest winter squash and pumpkins before frost. For best storage quality, leave an inch or two of stem on each fruit.
- Gourds should be harvested when their shells become hard or when their color changes from green to brown.
- The average first frost usually arrives about October 15-20.
- Broadleaf herbicides can be applied now to control cool season weeds such as chickweed and dandelion.
- Now is a good time to apply lime to "sweeten" acid soils if indicated by a recent soil test.

—Chip Tynan, The Answer Service

Subdistrict Elects New Officers

May 20, 1992, the Commission of the Botanical Garden Subdistrict of the Metropolitan Zoological Park and Museum District of the City of St. Louis and St. Louis County held its annual meeting at the Garden. The commissioners elected new officers for 1992-93. They are: Theresa Loveless, chairman; Homer E. Sayad, vice chairman; Robert H. Orchard, treasurer; and Dr. Roy Jerome Williams, Sr., secretary.

The Subdistrict is comprised of ten members, five each from St. Louis City and County. The commissioners serve as the public body responsible for receiving and disbursing funds acquired throught the property tax support approved by voters in 1983.

Missouri Botanical Garden

CALENDAR OF EVENTS

September-October 1992

SEPTEMBER

1-7 SATURDAY-MONDAY

Cactus Society Show

9 a.m. to 8 p.m. daily through September 7, Orthwein Floral Hall, Ridgway Center. The Henry Shaw Cactus Society presents its magnificent annual display and sale. Free with regular Garden admission.

12 SATURDAY

Botanical Illustrations Exhibit

9 a.m. to 5 p.m. daily through October 24, Monsanto Hall, Ridgway Center. Drawings by artist Francesca Anderson are on display. Free with regular Garden admission.

Kemper Center for Home Gardening

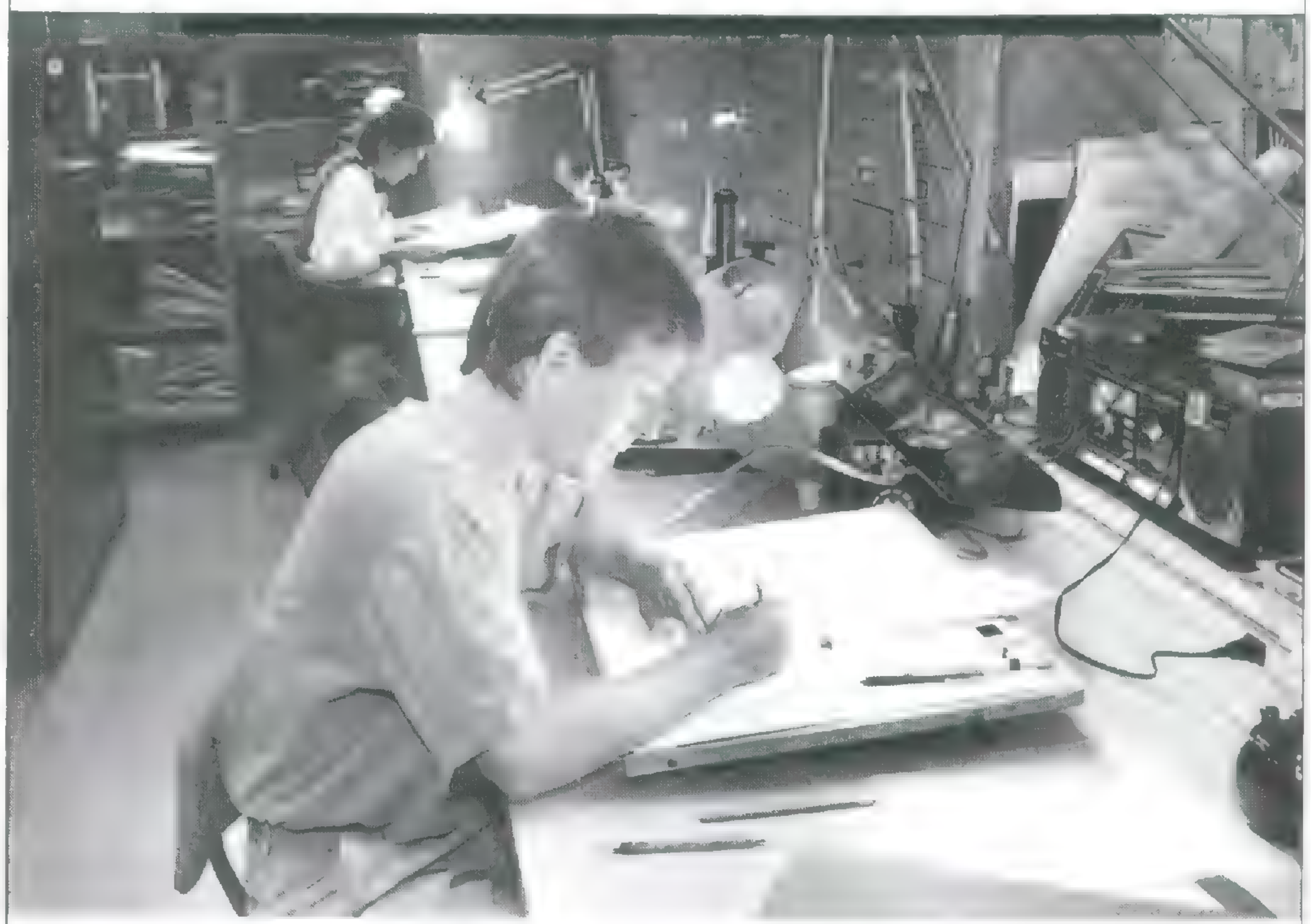
Open 10 a.m. to 4 p.m. daily. Plant Doctor available 10 a.m. to noon and 1 to 3 p.m. Monday through Saturday. Free with regular Garden admission.

Tower Grove House Tea Room

Open for luncheon Monday through Friday, 11:30 a.m. to 1 p.m., February through November, plus special Holiday Luncheons in December; advance reservations only. Call 577-5150.

Garden Walkers' Breakfast

7 to 10:30 a.m., every Wednesday and Saturday. Restaurant and grounds open early; free admission until noon. Sponsored by the American Heart Association. Call 577-5125 for information.



SEPTEMBER 12 / "The Unseen Garden"

10 a.m. to 3 p.m., John S. Lehmann Building. Enjoy a rare look behind the scenes of the Garden's research division, including the herbarium, usually closed to visitors. Botanists will be on hand to explain and demonstrate the Garden's research activities around the world. Tours will be self-paced and self-guided. Free with regular Garden admission.

OCTOBER 11 / "Best of Missouri" Market

10 a.m. to 5 p.m., grounds. See back cover for details. Pictured (from left): Mary Longrais, president of the Members' Board; Leslie Dimit and Susie Schulte, co-chairs.

12-13 SATURD
SUND

Men's Garden Clubs Show

Noon to 5 p.m. Saturday, 9 a.
5 p.m. Sunday, Orthwein Flor
Hall, Ridgway Center. The G
St. Louis Men's Garden Club
present a complete horticultu
display including roses, veget
fruits, house plants, cacti, and
home canning. Free with regu
Garden admission.

17-20 THURSD
SUND

Fall Bulb Sale

9 a.m. to 6:30 p.m., Thursday
Friday; 9 a.m. to 5 p.m., Satu
and Sunday. Orthwein Floral F
and Garden Gate Shop. Choos
from a wide variety of spring
blooming bulbs and beautiful
merchandise, all at 20% off to
members. See page 13.

20 SUNDAY

Daylily Sale

10 a.m. to 5 p.m., Ridgway Ce
The Missouri Botanical Garde
Daylily Association holds its a
sale. All plants are extra divisi
from the Jenkins Daylily Garde
Free with regular Garden
admission.

WALKING TOURS
Every Tuesday, Saturda
and Sunday 1:00 p.m.

Join the Garden Guides for
tour of the grounds, featuring
the art, architecture, history
and horticulture of the Garder
Meet at the ticket counter in
Ridgway Center. Free with
regular Garden admission.

6 SATURDAY

od Festival 1992:
elebrating 500 Years
America's Foods"

m. to 3 p.m., Ridgway Center,
mper Center and grounds. The
Louis Chapter of the American
rt Association and the Garden
n up to demonstrate that nutri-
s, lowfat eating is delicious,
lthy and part of the cultural
tage of many nations. Demon-
tions, samples, lectures, and
cial activities for children. Free
n regular Garden admission.

-27 SATURDAY-SUNDAY

lia Society Show

n to 5 p.m. Saturday, 9 a.m. to
m. Sunday, Orthwein Floral
, Ridgway Center. A colorful
y of special arrangements and
vidual blooms will be judged and
layed by the Greater St. Louis
lia Society. Free with regular
den admission.

OCTOBER

9 FRIDAY

"Missouri Country Affair"

7:30 to 11:30 p.m., grounds. Garden members $60 per person; non-members $70 per person. Watch your mail for a special invitation; see back cover for details. Pictured: Nora Stern, co-chair; not pictured: Ellen Dubinsky, co-chair.

10-11 SATURDAY-SUNDAY

Gesneriad Society Show

Noon to 5 p.m. Saturday, 9 a.m. to 5 p.m. Sunday, Ridgway Center. Featuring plants of the popular African Violet family. Free with regular Garden admission.

17-18 SATURDAY-SUNDAY

Orchid Society Show

11 a.m. to 5 p.m., Orthwein Floral Hall, Ridgway Center. An exciting new event at the Garden! The Orchid Society of Greater St. Louis hosts a juried show for orchid societies throughout the Midwest competing for American Orchid Society trophies and awards. Commercial growers will offer orchids for sale. Free with regular Garden admission.

SEPTEMBER 19
Members' Day "Plant Fall for Spring Color"

10 a.m., Shoenberg Auditorium. Lecture by June Hutson, MBG curator of the Temperate House, Rock Garden and Dwarf Conifer Collection. Plan ahead now for color in your garden next spring, including annuals and traditional spring blooming bulbs. Free, for members only. Seating is limited.

OCTOBER 18
Members' Day Autumn Stroll

1 to 4 p.m., grounds. Listen to the delightful sounds of the Rivertown Quartet as you stroll through the Garden, enjoying free cider, crisp autumn air and beautiful fall colors. Free, for members only.

From the Garden Gate Shop

Fall Bulb Sale

Members' Pre-Sale
September 17—September 20, 1992
Thursday & Friday: 9 a.m.-6:30 p.m.
Public is invited
Saturday & Sunday: 9 a.m.-5 p.m.

The Orthwein Floral Hall will be filled with spring blooming bulbs from Holland plus hundreds of colorful hardy mums. A representative from Holland will be on hand to answer questions about planting and care of bulbs. The Shop will have a lovely array of gifts, books and garden accessories—all at 20 percent off for members.

Barbara Perry Lawton Visits the Shop

On Tuesday, October 20 from 2 to 4 p.m., the Shop will host garden writer Barbara Perry Lawton, who will be signing copies of her new book *Improving Your Soil*, Ortho, $8.95. The book is a detailed guide to turning bare ground into a beautiful and productive garden. It includes step-by-step suggestions for identifying and correcting soil problems and maintaining your garden.

1993
Missouri Botanical Garden Calendar

1993 Calendar Is Here!

Once again the new Missouri Botanical Garden Calendar is available in the Shop, featuring all new color photographs by Jack Jennings. The 16 x 12-inch poster-size calendar is printed on recycled paper.

This is Jack Jennings' twelfth calendar for the Garden. Jack visits the grounds almost every day, in every season and type of weather, recording the cycles of growth and bloom. His spectacularly beautiful photographs capture the timeless spirit of the Garden for all who cherish it.

The calendar, including a handsome poster featuring the Center for Plant Conservation, is available in the Shop or by mail (see form at right) for $10.95 plus postage. Members receive their usual 10 percent discount.

1993 Calendar Order Form

Please send me __________ Missouri Botanical Garden Calendars at $10.95 each (plus $3.50 postage per address. Add $1 for each additional calendar sent to the same address. To mail outside U.S.: call (314) 577-9581.)

NAME ____________________
ADDRESS ____________________
CITY ______ STATE ______ ZIP ______
TELEPHONE ____________________

☐ Enclosed is my check for $__________ .
Payable to: Missouri Botanical Garden
☐ Please charge:
VISA/MC No. ____________________
Expiration date ____________________
Name as it appears on card:
____

Mail to: Missouri Botanical Garden
Garden Gate Shop
P.O. Box 299, St. Louis, MO 63166-0299

The editorial committee (from left): John Karel, Bob Gaddy, Larry DeBuhr, Barbara Addelson, William Rowe, Carmen Patterson. Not pictured: Mary Wiese.

A New Guide to Birds

A NEW illustrated guide, *Birds of Missouri Botanical Garden and Tower Grove Park*, a new illustrated guide, is now available in the Garden Gate Shop. The 40 page book includes general information on birding, a drawing and description of each of 24 birds commonly seen in the area, a complete checklist, and maps of "hot spots" for birding in the Garden and the Park. The guide was prepared by a dedicated group of volunteers working with the Garden's Education Division and was made possible by generous support from Dr. Robert E. Kleiger of St. Louis, Additional support was provided by the Webster Groves Nature Study Society and Henry P. Day.

In honor of the new publication, the Garden has placed a "Nature Observances Registry" in the lobby of the Ridgway Center. Visitors are invited to share their sitings of birds and animals in the Garden with others by recording their observations in the handsome handbound book. As each volume is filled it will be placed in the Garden's Archives.

Graduate Student News

Ivon Ramirez, a Ph.D. student at the University of Missouri-St. Louis, was selected for a Selby Gardens internship and spent the summer in Sarasota, Florida writing two chapters on various genera of bromeliads for a new edition of David Benzing's *Biology of Bromeliads*. Ivon recently completed her M.S. degree with P. Mick Richardson and is now deciding on a topic for her Ph.D. thesis. Ivon was accompanied by her husband, German Carnevali, a Ph.D. student at UM-St. Louis with Paul Berry. German worked towards the completion of the orchids for the forthcoming *Flora of the Venezuelan Guayana*.

Carlos Reynel, a doctoral student at UM-St. Louis with Al Gentry, attended the Peruvian Botanical Congress in Lima as part of the *Flora of Peru* contingent and then visited several herbaria in Europe. Funded by Tinker Foundation funds awarded to UM-St. Louis, Carlos spent the remainder of the summer as an intern at the Inter-American Development Bank in Washington, D.C.

Francisco Lorea spent a month in Mexico collecting plants in the Lauraceae (the laurel family) as part of his doctoral-studies with Henk van der Werff.

Jennifer Talbot, holder of the 1992 Elizabeth A. Balzer Fellowship and a Ph.D. student at Washington University, has received a financial award from Sigma Xi, The Scientific Research Society. Jennifer is studying the Hippocrateaceae family and will undertake field work in South America.

Jennifer Matos has successfully completed her Ph.D. thesis at Washington University. Extensive field work was combined with the latest laboratory techniques to resolve taxonomic problems in the members of the *Pinus montezumae* complex in Mexico.

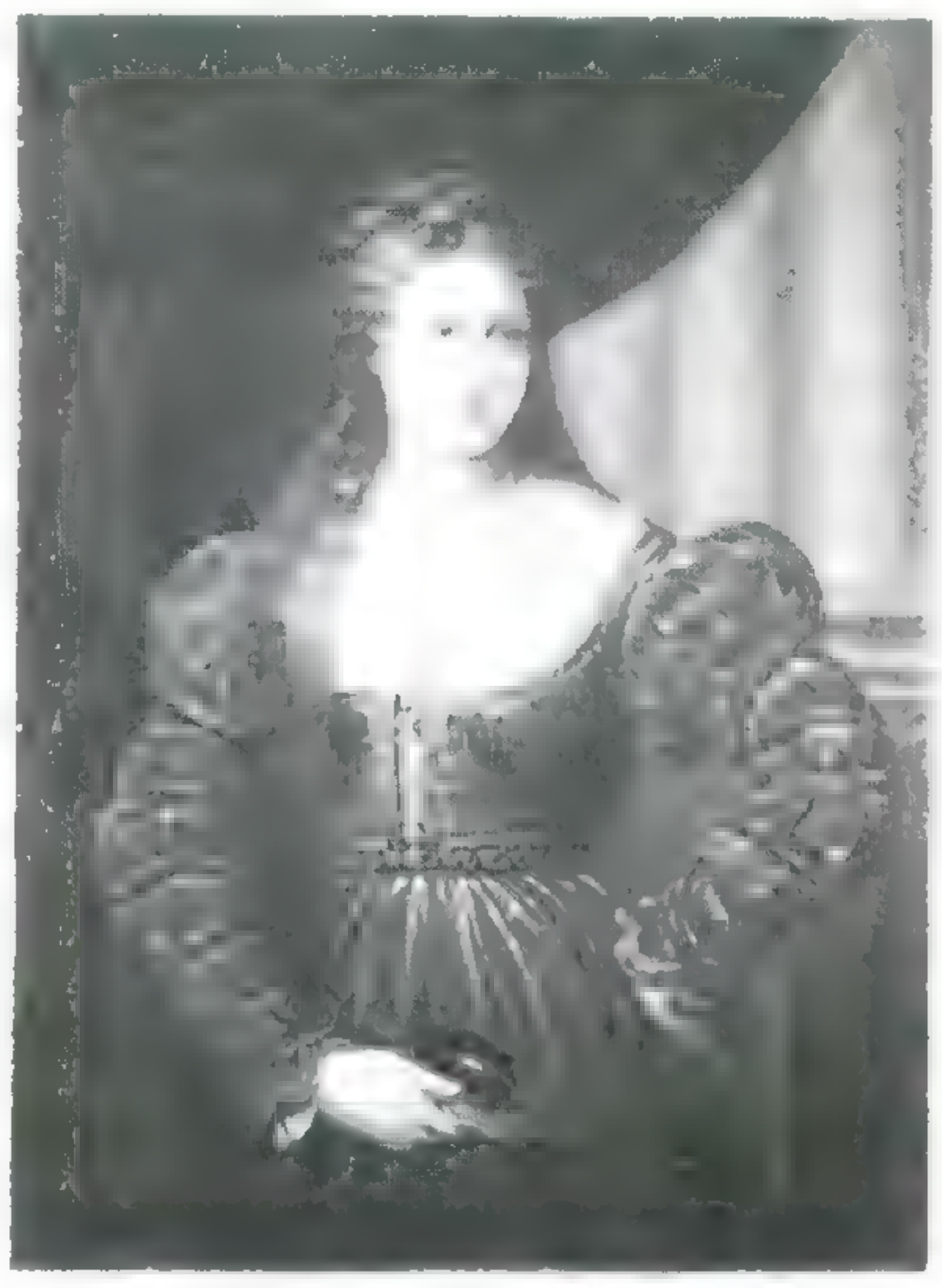
—P. Mick Richardson, Ph.D.
Head of Department of Graduate Studies

Gift Planning

Even though we typically associate taxes with April, the best time to consider the benefits of tax planning is in the Fall of the year while there is plenty of time to consider options prior to the December 31 deadline for 1992 deductions. In addition, September and October are far enough in the year that one has a reasonably representative financial history, yet early enough if changes are necessary.

One of the most beneficial ways to save taxes is by making charitable gifts and, of course, throughout its history the Garden has relied on annual donations. Outright gifts are simple and direct and can include not only cash, but tangible and intangible personal property as well. Planned gifts are more sophisticated transfers of assets that can offer additional tax benefits, depending on the technique and the type of assets used. Certain techniques, such as charitable gift annuities allow the donor to continue to receive an income from the property, and yet receive substantial tax benefits.

To assist our donors, the Garden is offering a guide to tax planning entitled "Simple Ways to Reduce Income Taxes" that covers these topics in a simple, easy to read booklet. If you would like your complimentary copy, without obligation, please call or write the Development Office, P.O. Box 299, St. Louis, Missouri 63166-0299. (314) 577-9532.



"Venetian Lady," a painting that belonged to Henry Shaw, has been cleaned and restored and is hanging once again over the mantel in the dining room of Tower Grove House. The 19th century European portrait was painted in oil on canvas in a style reminiscent of 16th century Italian works. It is unsigned. The restoration was funded by the Tower Grove House Auxiliary as part of the ongoing restoration of Tower Grove House.

EARTHKEEPERS

In Harmony With Life

MAMA Nature's Munch Room, Speck Trail Junction, the Time Capsule Room and a visit to the Connector Inspector—these are just a few of the stops fourth through sixth grade students make during their Earthkeeper experience at Shaw Arboretum.

In 1972 the Arboretum was designated a National Environmental Education Landmark by the Department of the Interior in recognition of its outstanding outdoor programs. In 1975, it became the regional center for the Acclimatization Institute, now known as the Institute for Earth Education.

Since the inception of educational programming in the early 1970s, the Arboretum has created a diverse collection of quality environmental education programs that strive to help students develop broad-based ecological understanding and deeper feelings for the Earth and its life forms. The programs also teach ways to live in closer harmony with the systems of life.

These goals are most successfully met in the 2½-day residential program called "Earthkeepers". This program was developed by the Institute for Earth Education, with the Arboretum serving as a pilot site. Since its beginning seven years ago, more than 1,000 upper elementary students have participated in the program at the Arboretum.

Earthkeepers can be recognized by the key chain and four keys they carry. The "K" key for knowledge and the "E" key for experience are earned during the course at the Arboretum, but students must complete tasks at home and at school to earn the "Y" key for yourself and the "S" key for sharing. These tasks may include the recycling of materials such as aluminum and glass, saving energy by turning off lights, spending time alone in the natural world at their own special place, and sharing their knowledge by recreating activities for family and friends.

The "Earthkeeper Training Center" consists of two log cabins on Arboretum property just south of the Meramec River. The low impact lifestyle at these cabins contributes to the experience. Vegetarian meals are prepared on a wood burning stove, water is carried in, cabins are heated by wood and light is provided by oil lamps. Through active participation and application, students not only develop understanding of major scientific processes fundamental to the Earth's systems but also develop a feeling of stewardship toward the Earth.

An Earthkeepers class studies spider webs.

A recent Earthkeeper trainee shared her experiences... "Thank you for teaching us wonderful facts about the Earth! Taking care of the Earth is hard work, but it's fun. I will always remember what you taught me because it is important to my future and the Earth's."

Another student said, "I sat there listening to all the sounds around me, actually I couldn't really only hear them, I could feel them... the magic was all around me."

With the "decade of the environment" upon us, the Arboretum's role in environmental education is becoming increasingly urgent. The staff will continue to create exciting learning experiences that provide firsthand encounters with the natural world, seeking to instill in the students a greater appreciation and understanding of the interconnectedness of life on Earth.

—Lydia Toth, Education Coordinator, Shaw Arboretum

Garden Awarded Education Grant by EPA

The Garden's Education Division has received a $16,538 grant from the Environmental Protection Agency to develop a curriculum on Aquatic Ecology and Water Quality for elementary and middle school students. The lessons will be packaged as a Suitcase Science kit available for loan to teachers, and the project will include a week-long teacher training workshop.

"We are very proud to be recognized by the EPA with this award," said Dr. Larry DeBuhr, director of the Education Division. "The agency received over 3,000 proposals requesting $75 million. The available funds totalled just $2.1 million. Being recognized in that kind of stiff competition is an indication of the quality of the Garden's educational programming."

The Suitcase Science program has been very successful at the Garden for many years. The new kit will be developed and tested in conjunction with the Garden's Stream Ecology Program, ensuring the effectiveness of the lessons and materials.

Twenty-five teachers will participate in the training workshop. They will study aquatic ecology, test the water quality of streams and rivers in the area, and learn to use the new Suitcase Science kit. The workshop will include an overnight canoe trip on the Meramec River.

Smithsonian Features MBG Suitcase Science Kit

At a multinational workshop held at The Smithsonian Institution in Washington, D.C. April 26-May 8, 1992, the Garden's Tropical Rain Forest Suitcase Science Kit was used as a model. Education specialists for six Latin American countries met with Smithsonian staff to examine the kit and produce education materials in Spanish. The materials will accompany a travelling exhibition on rain forests entitled, "Our Forest, Our Inheritance." The exhibition, being produced in Latin America, will give Latin American perspectives on rain forest issues. It is being produced in Spanish and Portuguese and will tour eleven Latin American countries.

The Garden's Suitcase Science Kit was produced, tested and revised in conjunction with the Smithsonian's Travelling Exhibition: "Tropical Rainforests: A Disappearing Treasure." The exhibition was in St. Louis January 11-April 5, 1992. Its stay in St. Louis was co-sponsored by the Garden.

Missouri Teachers Visit the Amazonian Rain Forest

THE Missouri Botanical Garden collaborated with the University of Missouri-Kansas City and the Missouri Coordinating Board of Higher Education to help 15 Missouri elementary teachers better understand the ecology of the rain forest. The teachers selected to participate in the project had demonstrated a past interest in tropical rain forests, had taught for at least four years, and had used innovative teaching methods with an emphasis on interdisciplinary teaching. Four teachers from the immediate St. Louis area joined 11 other teachers from throughout Missouri on this ''Rain Forest Rendezvous.'' The St. Louisans were: Margaret Eisenberger, Chesterfield Day School; Carole Granger, Ross Elementary School; John Reed, Hawthorne Elementary School; and Sharon Stevenson, Point Elementary School.

The program started in June when the teachers assembled at the Kansas City Zoo for a two day instructional program. During this initial workshop the participants received a general orientation to the ecology of tropical forests, including instruction on their locations, climate, biodiversity, and the causes and consequences of deforestation. The teachers were also provided with logistical information that would make their trip to the Amazon more enjoyable.

On July 11, the 15 teachers and four program staff flew from Miami to Iquitos, Peru. Early the next morning, the group boarded a boat for a two and one-half hour ride down the Amazon River to Explorama Lodge. During the next five days the Missouri teachers, along with 85 teachers from other states participated in a variety of workshops and activities. Some of the workshops included Rain Forest Ecology, Rain Forest Products and Their Uses, Rain Forest Conservation, Medicinal Uses for Plants, and classes on tropical mammals, birds, plants, fish, reptiles, amphibians, and insects. The group also experienced a side trip to the Napo River.

Although the participants experienced many exciting and interesting events, the highlight of the trip was a visit to the canopy walkway at ACEER (Amazon Center for Environmental Education and Research). This unique research and educational facility, located on a tributary of the Sucusari River, has developed a canopy walkway that allows visitors to study plants and animals which live in the rain forest canopy. The teachers were able to climb up a number of wooden platforms and suspended walkways to a height of 97 feet. Additional sections of the canopy walkway, which will allow access to even higher levels, are under construction.

Climatron manager John MacDougal (right) led the teachers on a tour of the Climatron during the curriculum development workshop.

The program culminated with a curriculum development workshop at the Missouri Botanical Garden on July 27 and 28. During this workshop, participants were introduced to instructional materials available to help them teach about the rain forest. The teachers used the Suitcase Science Kits from the Stupp Teacher Resource Center, investigated activities on biodiversity developed by the Education Division, visited the Climatron and Herbarium, and reviewed all of the wonderful things they had seen and done in the Amazon.

Even though the culminating workshop is over, the project is far from finished. All of the teachers who participated in the program will be conducting workshops for teachers in their own schools and communities. Additionally, they are all developing lessons that will be used with the children they teach.

The benefits from the project go far beyond the immediate experience in the Amazon by the teachers. The children in Missouri's schools will benefit for many years into the future. And as the children learn more about the important ecosystems that support life on earth, and become more knowledge about adults, the entire world and the plant and animal inhabitants will benefit.

Magnet School Planning Advances

The Missouri Botanical Garden, St. Louis Zoo, St. Louis Science Center, and the University of Missouri-St. Louis have been working with the St. Louis Public School District for the past few years to plan and implement two new investigative learning centers, one each at the elementary and secondary levels. These magnet schools provide the Garden, as well as the other collaborating institutions, with an exciting opportunity to help improve science education for the children of St. Louis.

The Botanical Garden Investigative Learning Center, an elementary school, will be located at the present Mullanphy Middle School site on Shaw Avenue. It is scheduled to open in September, 1993. This school will have close programmatic ties to the Missouri Botanical Garden, and will also collaborate in meaningful ways with the St. Louis Zoo and the St. Louis Science Center. The middle school will be located near the Science Center, but a location has not yet been selected.

The St. Louis Board of Education recently approved an operating agreement with specifies that an independent commission composed of representatives from each science institution and from the school's Parent Teacher Organization, will be appointed to provide advice and recommendations on the programs and management of the schools. The commission will provide periodic reports on the progress of the programs at the schools and make recommendations about the principals to be hired at the schools.

Between now and September, 1993, the Mullanphy building will undergo major renovations to allow for its conversion into a magnet school. In addition to general repairs, new science laboratories and classrooms will be added to accommodate future programs. A principal and instructional staff will be hired in early 1993. Staff training and final program preparations will be completed during the summer of 1993.

Garden Sponsors a Belize Adventure

Lush tropical rain forests, the Maya Mountains, subtropical pine savannahs, mangrove swamps and marshes on the coast and the great barrier reef of the blue Caribbean—these are the natural wonders and ecological diversity that await St. Louis adventurers who travel with the Garden to Belize.

Belize, formerly British Honduras, supports over 500 species of exotic birds, 250 varieties of orchids, and is one of the last stands of the elusive jaguar. Visitors can expect to see five-foot iguanas sunning themselves along tropic rivers, howler monkeys screaming in the jungle canopy, and countless caves and cascading waterfalls. While visiting the Maya Mountains, the traveler will see subtropical pine forests with epiphytic bromeliads and orchids growing on the trunks and branches of the Caribbean pines and tree ferns gracing the forest floor.

Perhaps the most captivating part of the adventure is a trip into Guatemala and the ancient Maya city of Tikal, where temple complexes and pyramidal astrological observatories attest to the magnificence of the Mayan culture. Climb to the top of Temple IV and view from eye level the canopy of the rain forest, with its incredible diversity of plants and animals.

After the pine forests of Mountain Pine Ridge and the spectacular ruins at Tikal, the group will fly to Ambergris Caye for two days of exploration of mangrove forests, coral reefs, and white coral sand beaches dotted with coconut palms.

Take a boat ride into the Crooked Tree Wildlife Sanctuary and see thousands of birds, including the endangered jabiru stork. Canoe down the Mecal River through miles of tropical vegetation past limestone cliffs with bat colonies hanging overhead. Walk around Cayo Rosario in the Caribbean and watch herons and egrets as they feed in the central lagoon. Snorkel at Hol Chan Marine Preserve and see an amazing diversity of fish living along the world's second largest barrier reef.

This trip is co-sponsored by the Missouri Botanical Garden and OASIS (Older Adult Service and Information System). Because of the limited accommodations available in Belize, participation on this trip is limited to 15. Dr. Larry DeBuhr, Director of Education at the Garden and Barbara Addelson, Instructional Coordinator, are leading the trip. For additional information call 577-5140.

The lantern donated to Seiwa-En by the city of Suwa, Japan.

Delegation from Suwa Visits Japanese Garden

Mr. Setsuji Iwamoto, the former mayor of Suwa, Japan, St. Louis' Sister City, led a group of 46 Japanese visitors to the Garden on June 22, 1992. In 1974 Mr. Iwamoto, who was mayor of Suwa at that time, took part in the groundbreaking ceremony for the Japanese Garden, *Seiwa-En*.

Mr. Iwamoto, himself a gardener, said that he was asked for his opinion by Koichi Kawana, the Japanese Garden's designer. "I had a good idea of what *Seiwa-En* would look like, since I was involved during the design. But the garden looks even better than I expected. The stone lantern donated by Suwa looks very nice and fits very well into the garden."

One of the carvers of that stone lantern, Mr. Shuji Kitahara, took part in the tour. Mr. Iwamoto said that Mr. Kitahara participated in the multi-city tour just so he could see the stone lantern.

"I felt like I was seeing my child," Mr. Kitahara said. "It has aged extremely well—we Japanese appreciate the aging of fine objects like this lantern."

Volunteers Needed for Guides and Instructors

The Guides and Volunteer Instructors at the Missouri Botanical Garden are among the most knowledgeable and dedicated volunteers at the Garden. If you are interested in working with children or adults, being part of an exciting team, and learning more about history, art, architecture and natural science, the Garden has a challenging opportunity for you! Applications are now being accepted for volunteers to be trained as Guides and Instructors beginning in January 1993. Please call Jeanne McGilligan, the volunteer coordinator, at 577-5187 by September 25, 1992.

New Sculpture Installed

A handsome bronze figure of a young Indian girl by American sculptor Sheila Hale Burlingame was installed in the Heckman Bulb Garden in June (below). The statue was donated in 1989 in memory of Julia and Charles Lamy by their daughters Julia, Mary and Isabel. The statue stood in Mr. and Mrs. Lamy's garden and probably dates from the 1930s. Restoration by Washington University Technology Associates, WUTA, preceded the statue's installation at the Garden.

Moving? Please Remember To Send Us Your New Address.

To avoid missing any of your membership mailings, you *must* give us your new address at least three weeks *before* you move. Please enclose the mailing label on the back cover of this *Bulletin*, and mail to: Membership Office, Missouri Botanical Garden, P.O. Box 299, St. Louis, MO 63166.

Name: ____________________

Old Address:

____

City ____________________

State ____________ Zip ____________

New Address: (Date effective: ____________)

____

City ____________________

State ____________ Zip ____________

Flora of Argentina

IN June 1992 Dr. Armando T. Hunziker and Dr. Fernando O. Zuloaga visited the Garden to discuss progress on the *Flora of Argentina* project. The project, headquartered in Argentina, is an international collaboration between Argentinean institutions and the Missouri Botanical Garden. In 1991 the Garden signed a five-year agreement of scientific cooperation with the Consejo Nacional de Investigación Científica y Tecnológica (CONICET), the major scientific organization in Argentina, to collaborate in the organization and development of the project.

Dr. Hunziker, director of the Museo Botánico in Cordoba, Argentina, is director of the project. The Garden has provided support for a computerized database in Argentina and continues to give assistance with fundraising, logistics and scientific cooperation.

The *Flora of Argentina* will be written in Spanish. It will be published in six volumes approximately every two years, with the first volume scheduled to appear in 1994. Sixty-five botanists from Argentina and ten from the Garden will contribute to the project.

The first phase, currently underway, is the preparation of a computerized checklist of all flowering plants in Argentina, estimated at 9,000–10,000 species. The checklist is based on pcTROPICOS, the botanical database system developed at the Garden. The checklist transfers a huge archive of valuable information gathered since 1937 on index cards at the Instituto Darwinion in Argentina into a form immediately available to researchers worldwide. The information can be constantly updated and represents an important step in the preparation of the *Flora of Argentina* itself.

The effort to write a *Flora of Argentina* is the first of its kind in the country. A manual containing keys of the genera of flowering plants of Argentina, begun by Lucien Hauman of Belgium, was updated and completed by a large group of Argentinean and international specialists and published in 1984 under the direction of Dr. Hunziker. Contemporary botanical research in Argentina has concentrated on regional flora projects.

The geographical area of Argentina is vast, dominating the enormously important region of southern South America, which is primarily temperate. The accelerating destruction of natural areas in several regions of Argentina is proceeding very quickly, making a comprehensive inventory of its botanical species essential for conservation and land use. ''We are very pleased to be able to assist in this extremely important work,'' said Dr. W. D. Stevens, the Garden's director of research. ''Being able to study Argentina's flora in relation to the rest of South America will add enormously to our understanding of the biology of the continent.''

Shown during the meetings at the Garden in June are (from left): Dr. Robert Magill, MBG; Dr. Fernando Zuloaga, Dr. Charlotte Taylor, MBG; and Dr. Armando Hunziker.

Raven Named Honorary Director of Nanjing Botanical Garden

In ceremonies at the Nanjing Botanical Garden Mem. Sun Yat-sen, on July 13, 1992, Dr. Peter H. Raven was appointed honorary director of the Nanjing Botanical Garden. Dr. Raven is director of the Missouri Botanical Garden. Nanjing and St. Louis are sister cities, and the Missouri Botanical Garden has had a sister-garden relationship with the Nanjing Botanical Garden since 1980.

The ceremony in Nanjing included officials from Jiangsu Province and its Science and Technology Commission. Professor He Shan-an, director of the Nanjing Botanical Garden, declared that Dr. Raven's appointment was being made partly in recognition of the longstanding and fruitful collaboration between the two institutions.

In accepting the appointment, Dr. Raven emphasized prospects for future collaboration on the Chinese-American project the *Flora of China*, which will produce a new account of all the plants of China and an associated database over the next 15 years. Raven also discussed the importance of sharing horticultural materials and general academicand scholarly exchanges which will further strengthen the programs of both institutions.

Flora of China Committee Holds Meeting

The *Flora of China* joint editorial committee celebrated near completion of the first two volumes of the project at its third meeting, held in Junming on June 29 and 30, 1992. Dr. Wu Zheng-Yi, director emeritus of the Kunming Institute of Botany, and Dr. Peter H. Raven are co-chairmen of the committee. Committee members learned that *Science Press*, and Missouri Botanical Garden have agreed to co-publish the 25-volume work.

Other topics discussed at the meeting included matters of format and style, addition of Chinese plant names spelled in pinyin, and progress on and scheduling of future volumes. In addition to the Chinese and American members of the committee, the meeting was attended by Dr. Jin Murata, of the Botanical Gardens in Nikko, part of the University of Tokyo. He will host the next joint editorial committee meeting, which will be held after the International Botanical Congress in August of 1993.

P · R · O · F · I · L · E

William G. D'Arcy, Ph.D.

DR. William G. D'Arcy, senior curator at the Garden, is one of the few botanists who can boast of being a businessman as well. D'Arcy became a botanist relatively late in life: he received his Ph.D. after he turned 40. D'Arcy's fascination with plants began in the 1960s on the West Indian island of Tortola. He had moved to Tortola after purchasing a soda-pop factory there to escape New York City where he was working as a market economist.

He had no idea that the move would precipitate a major career change for him. "I started looking at the flora of the island out of boredom," says D'Arcy. "While my family enjoyed our frequent visits to the beach, I found it quite dull. The plants growing behind the beach were much more interesting to me."

D'Arcy took his new-found interest in plants very seriously. He learned to make herbarium specimens and sent plant samples away for identification. Before leaving the island to study botany at the University of Florida, he collected enough data to write a florula of the island's plants. The florula was published while he was a master's student in Florida.

While at the University of Florida, D'Arcy chose to study the Solanaceae (potato) family of plants. He continues that study today. "Solanaceae is one of the most economically important plant families," he explains. The family includes not only potato, but bell peppers, tobacco, petunias, eggplants, and tomatoes. D'Arcy has chosen to study the relatively unknown plants in the family. "Of the 95 genera in the family, 85 are unknown to most people. I've chosen to work on the unknown 85 genera so I can make a greater contribution to the body of knowledge about the family."

D'Arcy grew up in Calgary, Alberta, Canada. He received a B.A. in political economy from the University of Alberta in Edmonton in 1954 and went to work for the Canadian Trade Service in Ottawa, then was transferred to Chicago. He later moved to New York to work for the American Car Company, then to Tortola. He sold the soda-pop company and moved to Florida where he worked as a herbarium assistant and studied for his master's degree from the University of Florida. D'Arcy moved to St. Louis in 1969 to work on his Ph.D. at Washington University, while working at the Garden half-time on the *Flora of Panama* project. He received his Ph.D. from Washington University in 1972.

Today he continues his extensive work on the Solanaceae, working on floristic treatments of the family for the southeastern U.S., Costa Rica and Mesoamerica. He recently completed treatments for China, Madagascar and Nicaragua.

When asked about his unorthodox path to botany, D'Arcy says, "I don't regret having done what I did before becoming a botanist. That experience gave me a good statistical background. And I appreciate having lived in such interesting places." D'Arcy is glad he ended up at the Garden. "Of all the places I've worked in, this is the best place in terms of the human relationships going on around you," he says.

VISITORS FROM TAIWAN—A delegation from the National Science Council (NSC), Taipei, Taiwan, Republic of China, visited the Garden on June 25, 1992 to discuss scientific matters of mutual concern. Shown from left: John Hsiao-Chung Wang, director of Science Division at NSC/ Chicago; Ho-Ching Lee Liu, program director, Division of International Programs, NSC; Dr. Chung-Yu Wu, professor and director, Division of Engineering and Applied Science, NSC; Dr. Han-Min Hsia, chairman, NSC; and Dr. Marshall R. Crosby, assistant director of the Missouri Botanical Garden. The visitors also purchased an Oriental hornbeam tree, Carpinun orientalis, during their visit.

IN MEMORIAM

Joseph F. Ruwitch

The Garden mourns the passing of Mr. Ruwitch on July 29, 1992. Mr. Ruwitch, former president of Renard Linoleum & Rug Company, was extremely active in local community groups. He had been a Garden member since the late 1960s and had served as a emeritus trustee of the Garden since 1988.

Mr. Ruwitch is survived by his wife, Elizabeth R. Ruwitch; a daughter, Jane Mitchell; a son, Dr. Joseph F. Ruwitch; a sister, Elizabeth R. Straus; and grandchildren.

"Joe and Liz Ruwitch have provided thoughtful, generous support for so many critical needs in our community," observed Peter H. Raven. "Their gifts and volunteer involvement have benefitted St. Louisans in the areas of higher education, health care, the visual and performing arts, and other social and community services. We are deeply indebted to the Ruwitches for making possible so many important features and programs at the Garden."

Assistance from the Ruwitches was significant in the construction of the Ridgway Center and the recent capital campaign for the Climatron renovation and other building projects. Gifts to the Japanese Garden made possible the installation of a ceremonial lantern and the breathtaking Peony Garden. The Ruwitches were also keenly interested in the Garden's scientific research program, and had participated last year in a group gift from the Board of Trustees to support floristic and computerization projects in recognition of Peter Raven's 20th anniversary as Garden director.

John K. Wallace, Sr.

Mr. Wallace, a member of the Garden since 1970, passed away July 26, 1992. Mr. Wallace was the former chairman and chief executive officer of Cupples Co. Manufacturers and a noted civic figure and sportsman. He is survived by his wife, Margaret How Wallace; two sons, Charles H. Wallace and John K. Wallace, Jr.; a daughter, Mrs. Henri DeCompiegne; grandchildren and great-grandchildren. John Wallace, Jr. serves on the Board of Trustees of the Missouri Botanical Garden.

The Wallaces recently participated in a family gift to name the Brookings Interpretive Center on the Tropics, an exhibit facility designed to inform visitors on the plant species and ecologies of the world's tropical, temperate, and desert regions. The Center, a memorial to the St. Louis philanthropist Robert Somers Brookings, currently houses a rotating schedule of travelling science exhibits while permanent displays are prepared for installation in 1994.

"We shall all sorely miss the participation of John Wallace, Sr. in our community," said Peter H. Raven. "Peggy and John have been wonderful friends for many, many years, and it will be our great honor to commemorate their involvement and generosity on a special plaque attached to one of the Brookings Interpretive Center's future exhibits."

Elmer G. Kiefer

Elmer G. Kiefer, a dedicated friend and member of the Missouri Botanical Garden for more than 35 years, passed away on July 16, 1992. Mr. Kiefer is survived by his wife, Ernstine (Dolly) Kiefer and their daughter, Mrs. Jack Heckenberg.

The Ridgway Center was named for Mrs. Kiefer's parents, Louise and Edmund Ridgway, through the support of the Kiefers and other family members.

"The friendship of Dolly and Elmer Kiefer has been a highlight of my twenty years as director of the Garden," stated Peter H. Raven. "Their steadfast devotion has ensured the success of many of our programs and services, and Elmer will be deeply missed."

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On the cover: A quiet snowfall in the Japanese Garden heralds the advent of winter.

—Photo by King Schoenfeld

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Comment

At the Crossroads

As we approach the end of another year, it is clear that 1992 has been a year of extraordinary transitions. Never before has the Garden been poised for such outstanding achievements; at the same time we are faced with demands on our resources that are almost overwhelming. Our challenge is to continue to find ways to meet the needs of our community, our children, and the global community on which all of our futures depend.

1992 brought major milestones in each of these areas. We welcomed our 30,000th family as members of the Garden, an increase of 50 percent since 1987. The herbarium mounted its four millionth plant specimen, a species from Africa that may prove to have properties effective against AIDS. The Education Division continued to expand its programs for children and adults with the Litzinger Ecology Center, an innovative open air classroom for ecological learning. The Garden received a $731,000 grant from the National Science Foundation to build and install educational displays in the Brookings Interpretive Center on the Tropics; we also co-hosted the Smithsonian Institution's Traveling Exhibit, "Tropical Rainforests: A Disappearing Treasure" in conjunction with the Science Center and the Zoo.

Continuing our policy of reaching out to the entire community, the Garden instituted a Cultural Diversity Council, dedicated to encouraging and supporting diversity on our staff and in all of our dealings with the community. In August we celebrated our second annual "Festival of Festivals," saluting the cultures of Japan, Greece, Italy and Native Americans. In December we look forward to holiday celebrations in honor of Christmas, Chanukah and Kwanzaa (please see back cover).

The year brought sadness also, with the loss of our longtime friends Harriet Baur Spoehrer, C.C. Johnson Spink, Joseph F. Ruwitch and Dr. Marguerite Ross Barnett. Each of these individuals served as a Garden Trustee and exemplified a truly selfless spirit by their generosity and leadership. They are deeply missed.

The cornerstone of all the Garden's achievements is the support of you, the members. As we face a global environmental crisis of unprecedented urgency, the Garden is being asked to respond to an ever-increasing list of demands on our time and resources. As you consider our recent request for an annual gift in addition to your membership support, I know that you will respond as generously as you can. Never before have the opportunities been so great or the challenges so enormous. Your support has been critical to our success, and I thank each and every one of you for your commitment and your help.

Peter H. Raven

CONGRATULATIONS AND THANKS go to the Members' Board for the success of the Missouri Country Affair benefit party and the "Best of Missouri" Market in October. Shown at the party are committee members (seated) Nora Stern, market co-chair, and Michael Cole; (standing, from left): Susie Schulte and Leslie Dimit, party co-chairs; Mary Longrais, president of the Members' Board; Marcia Trulaske, Jean Richardson, Donna Walker; and Ellen Dubinsky, market co-chair.

Dan Harder checks on palm trees that were righted and propped up with two-by-fours.

Landscapes that were green and lush before the hurricane were totally devastated. The damage shown here was typical.

Andrew Hits Home

Garden Scientists Race to Help Fairchild Tropical Garden

WHEN the 165-mile-an-hour winds of Hurricane Andrew roared through the Miami area late in August, the world watched the images of devastation on television with horror. As volunteers struggled to help in the terrible aftermath of the storm, botanists at Fairchild Tropical Garden in Coral Gables were confronted with the overwhelming task of trying to rescue their priceless collection of rare and endangered plants.

The Missouri Botanical Garden was first on the scene to help. Shortly after the hurricane, William Klein Jr., director of Fairchild and a former assistant director of the Missouri Botanical Garden, asked Peter Raven for help. On August 29, scientists Mary Merello and Dan Harder of the Garden's research division arrived at Fairchild.

One of the first things they did was to get on the phone to colleagues at The New York Botanical Garden, Cornell University, the Wood Products Laboratory at the University of Wisconsin, Madison, and the Royal Botanic Garden, Kew, in London, all of whom sent help. ''The staff at Fairchild was already hard at work coping with the situation,'' said Merello, ''but the damage was just incredible. The garden had been so dramatically transformed that

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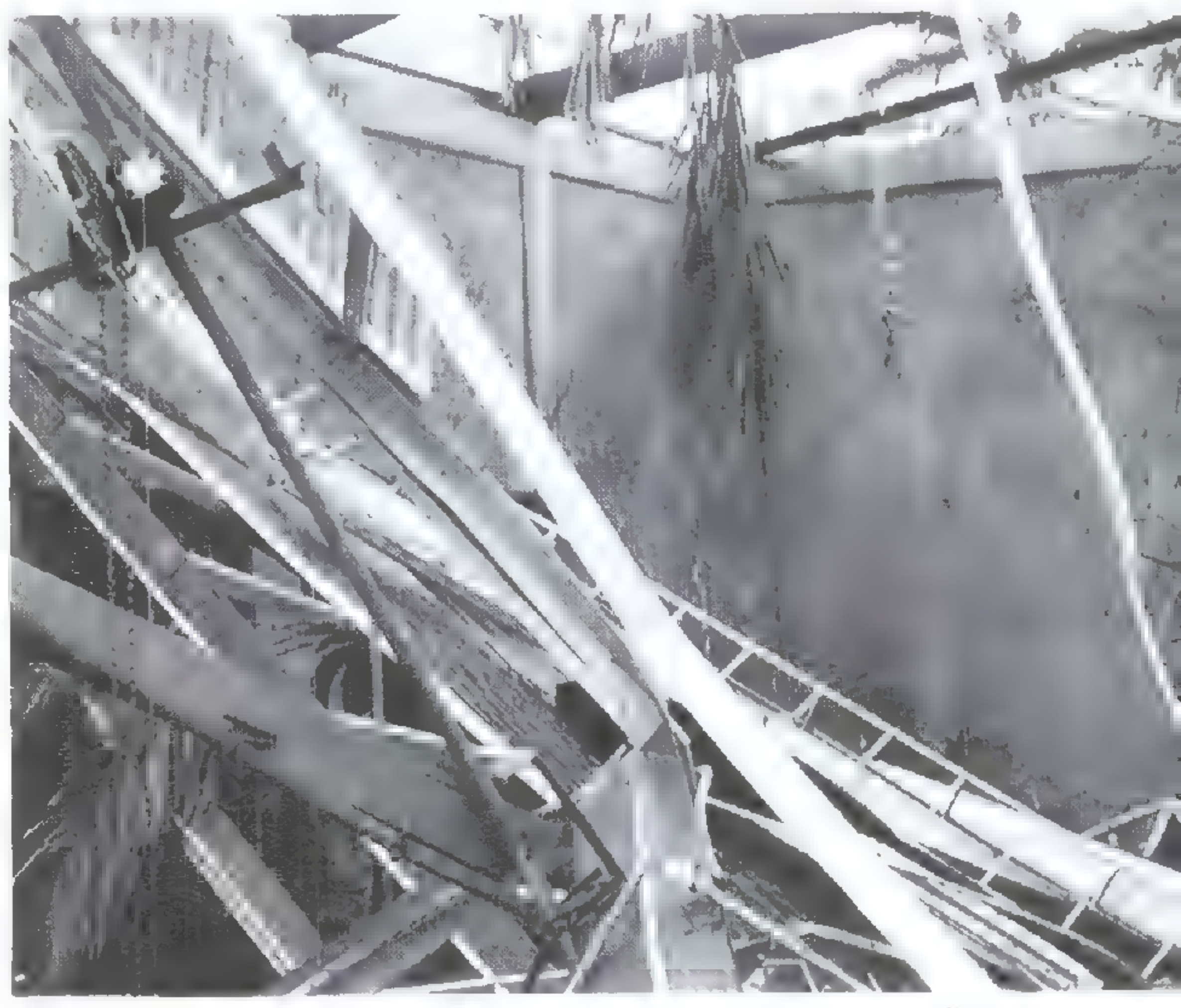

The collapsed roof of the Rare Plant House at Fairchild Tropical Garden.

Above: Greenhouses at the USDA Homestead near Fairchild Garden suffered similar losses. At left: A 40-foot sailboat lies amidst a flattened grove of coconut palms. The nearest anchorage was a quarter of a mile away.

PHOTOGRAPHS BY DAN HARDER

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OCT 29 1992
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ANDREW continued

many areas were unrecognizable. It looked like it had been bombed. The spirit of the staff was amazing, especially since many of them had also lost their homes and all of their personal possessions.''
spirit of the staff was amazing, especially since many of them had also lost their homes and all of their personal possessions.''

Fairchild's collection is composed extensively of tropical trees and cycads, plants that were especially vulnerable to the storm. Andrew stripped some trees of their leaves and fronds, snapped off trunks and upended many others. Palms that had been pushed over but retained their roots were righted by cranes and propped up with planks. Plants that were not killed outright by the winds later succumbed to lack of water, exposure to direct sunlight and salt spray, and some losses may only become apparent as hidden damage and fungal diseases take their toll.

''Fairchild covers an area approximately equal to the Garden here,'' said Harder, ''and they estimate they lost 60 to 70 percent of their trees, with more to come.''

During their four-day stay, Merello and Harder were able to collect samples of leaves for DNA from some of the downed plants to keep at the Missouri Botanical Garden as part of DNA/Banknet, an international effort to maintain DNA of endangered species. They also visited other botanists and gardens with significant tropical plant collections in the Miami area, many of whom were struggling to keep valuable plants alive with expensive bottled water.

Volunteers using donated equipment struggled to right one of thousands of clusters of palms upended by the storm.

September 16-19, 1992, two more Garden staff members visited Fairchild. Petra Malesevich of the research division and Kathy Upton of the horticulture division are specialists in the Araceae, a family of tropical plants known as aroids, which includes such familiar plants as Anthurium, Caladium and Philodendron.

''We were the first people to go into their rain forest area,'' Petra said. ''We brushed out debris, pruned and staked surviving plants, did the initial damage assessment and made recommendations for plant recovery, which allowed a team of volunteers to go in a few days later to follow up. The tougher aroids survived the initial storm but are now exposed to direct sunlight and drying conditions; the Fairchild staff is using our inventory to allocate resources and manpower to try to save as many as they can.''

Malesevich and Upton also evaluated the aroid collection in the Rare Plant House, where the hurricane had ripped the roof off the building, allowing it to fall onto the plants inside, which were badly damaged, completely destroyed or blown away. The Garden staffers prepared beds and installed replacement aroids where possible.

Petra said, ''The most inspiring thing to come out of this tragedy is the amazing spirit of the people at Fairchild. They are planning to send a staff member to help out at National Tropical Botanical Garden in Kauai, Hawaii, and they are looking at Hurricane Andrew as a unique opportunity for a new beginning.''

Missouri Department of Conservation & the Missouri Botanical Garden

Sharing A Commitment

The Garden works with a number of governmental agencies worldwide to help achieve its goals in research and conservation. At home, the Missouri Department of Conservation shares the Garden's interests in botany, environmental education, and the conservation of biodiversity, and the two organizations have a long history of cooperation. Specialists with the Conservation Department frequently advise the staff at the Garden and the Shaw Arboretum on forestry and wildlife topics, and the management of streams, glades and prairies. Researchers at the Garden have in turn provided valuable information on the biology and distribution of rare and endangered plant species in Missouri, and were instrumental in helping the Missouri Natural Heritage Program (which is part of the Conservation Department's Natural History Division) get its computer database on rare and endangered plants of the State started in 1980.

More recently, the Garden and the Conservation Department have teamed up to reintroduce the federally endangered running buffalo clover, *Trifolium stoloniferum*, back into the wild in Missouri. The State has helped the Garden to establish a deer-proof nursery for the propagation of rare and endangered species at the Shaw Arboretum (see story at right). The Garden has already used this facility to propagate several thousand plants of the clover from samples collected by the Center for Plant Conservation. Botanists have transplanted these samples to protected sites in several areas of the State to test the feasibility of producing stable populations of the species, which has declined dramatically throughout its range during this century.

The Department of Conservation has also provided strong support for the development of the Shaw Arboretum's educational facilities. After the Arboretum's development plan was completed last year, the Conservation Department contributed a $300,000 matching grant for the development of educational exhibits in the Brick Manor House. When completed, these exhibits will inform visitors on a variety of features relating to natural resources. In the past, the Department has periodically awarded grants for specific projects to both the Garden and Tower Grove Park, as part of its efforts to contribute to education and the enjoyment of natural resources around the State.

The best-known cooperative effort between the Garden and the Missouri Department of Conservation is the Flora of Missouri Project, which was started in 1987. The aim of this project is a revision of Julian Steyermark's monumental *Flora of Missouri*, the single most important volume on the identification and distribution of Missouri's flora. Although the revised edition is slated for completion in 1995, there will always be a need for research on the State's flora. To this end the Conservation Department has recently turned the ''Flora of Missouri botanist'' position at the Garden into a permanent job. This will insure a bright future of shared growth and cooperation in the study of the Show-Me State's plant life.

—George Yatskievych, Ph.D
Director, Flora of Missouri Project

THIS WINTER AT SHAW ARBORETUM

Oh, Deer!

At left: Deer have browsed as high as they can reach on vegetation throughout the Arboretum. Here they have stripped English ivy off the walls of the Trail House. Above: The Whitmire Wildflower Area is just one of the Arboretum features protected by the new deer fence. Shown here is the boardwalk over one of the three pools in the newly constructed wildflower area.

THE LARGEST and the most popular wildlife species at Shaw Arboretum is the white-tailed deer. These beautiful animals often can be seen grazing in the meadows or the prairie, or may be sighted fleeing into the woods along hiking trails.

Throughout the eastern United States, deer have recently undergone a surge in population. This has resulted from total elimination of their natural predators—wolf, cougar and bear—and from reduced hunting pressure by humans. It is estimated deer populations are now at above the level they were when the first European settlers arrived, all of them stuffed into highly fragmented natural and semi-natural areas, where deer may be five to ten times more abundant now than they were at that time.

Naturally curious and having intimate knowledge of their feeding ranges, deer often taste any plants that have recently appeared in their territories. At the Arboretum wildflower garden (in development near the brick manor house south of Pinetum Lake) deer have already killed, partially uprooted or severely pruned many of the newly planted specimens, resulting in significant damage in every part of the garden. Another habit, unique to male deer, is ''racking,'' or rubbing of the antlers on shrubs and small trees, scraping off the thin bark of these plants. Racking has killed or damaged many shrubs and saplings in the Pinetum and wildflower garden.

Furthermore, damage by deer is not unique to planted vegetation. Deer have definite feeding preferences. They are especially fond of mild-flavored plants in the lily, orchid and related families. The growing abundance of deer at Shaw Arboretum has caused members of these plant families to be particularly hard hit by deer. For example, *Trillium* comes up by the thousands in late winter at the Arboretum, yet only a handful ever flower in spring because they are cut off at ground level by deer. Arrowhead plants (*Sagittaria*) and water plantains (*Alisma*) planted out at the Arboretum's new wetland have been heavily and repeatedly browsed by deer, and the whole planting of 350 pickerel plants (*Pontederia*) was wiped out by deer wading into the marsh and pulling out entire plants. Adding insult to injury, the deer ate only the leaf stalks, foregoing the leaf blades and leaving the roots to die from exposure. Deer also favor acorns and the growing twigs of oak seedlings, threatening the future regeneration of the Arboretum's oak-hickory forests, already besieged by cedar, elm and sugar maple invasion.

Whatever procedure or combination of procedures is used, the need to control the deer populations in areas such as Shaw Arboretum is yet another example of the imbalances wreaked upon the ecosystem by the activities of humans. The redressing of these imbalances calls for active management of the natural area. Lack of management almost always results in the loss of sensitive species of plants and animals to competition by aggressive species such as deer and redcedars. Reintroduction of large predators is impractical. Birth control implants require trapping and surgery. Deer repellents afford only limited protection to valuable plants, all the less so when deer are numerous and hungry.

With these observations in mind, the staff at the Arboretum has implemented two strategies to manage the deer. The most obvious of these, a new deer exclusion fence, recently was constructed around the core horticultural area of the Arboretum to help eliminate damage caused by deer in the wildflower garden and Pinetum. In late August, state conservation agents and Arboretum staff cooperated in tranquilizing and relocating the deer from inside the enclosure to the nature preserve area outside the fence. This apparently humane procedure is very stressful to the animals, and is practical only for small numbers of deer, as it is expensive and laborious and requires a place to which the deer can be relocated.

A second approach to managing the deer population at Shaw Arboretum will be a special January muzzle-loader deer hunt. The deer herd has grown steadily since the last hunt five years ago, notably intensifying damage to planted and natural vegetation (including several kinds of damage not mentioned above). The Arboretum will be closed to visitors the weekends of 9-10 January and 16-17 January. Note that in a change in policy from the past, Shaw Arboretum **will remain open** during the regular deer firearm season in November. The perimeter of the Arboretum will be patrolled throughout the November season to prevent illegal hunting.

—James C. Trager, Ph.D., Arboretum Naturalist, and John Behrer, Arboretum Superintendent

Dr. Marshall R. Crosby

Crosby Is Named Senior Advisor to the Director

September 3, 1992, Dr. Peter H. Raven announced the appointment of Dr. Marshall R. Crosby, 49, to the newly created position of senior advisor to the director and also as senior botanist at the Missouri Botanical Garden.

Dr. Crosby, a native of Florida, joined the Garden staff in 1968, upon the completion of his Ph.D. studies at Duke University. September 3 marked his 24th anniversary at the Garden. During his long tenure here, he has served as editor of the *Annals of the Missouri Botanical Garden*, the Garden's principal scientific publication; director of research; and assistant director. Crosby initiated several of the Garden's other research-related publications, including *Herbarium News*, a widely distributed newsletter of interest to systematic botanists; *Novon*, a very well-received journal on new species of plants; and the Garden's *Monographs in Systematic Botany*.

Marshall Crosby is an internationally respected student of mosses, a worldwide group of plants consisting of about 9,000 species. He has made distinguished contributions to the study of mosses, as recently evidenced by the publication of *Index of Mosses, 1963-89*, a Garden publication that catalogues all of the names of mosses published during the 26-year period indicated. The *Index* is a key work for those who are concerned with the classification and naming of mosses. Crosby is leading the Garden's efforts to produce a worldwide checklist and database on the world's mosses, and ultimately a flora, or comprehensive account, of all the mosses of the world.

Crosby's work on the *Index* led him to investigate better ways of compiling botanical data, which led him to work with Dr. Robert Magill, another Garden bryologist, in the development of TROPICOS, the Garden's revolutionary computer database system. "In a very few years we've come a long way from index cards, typewriter and keypunching!" Crosby said.

In announcing this appointment, Dr. Raven stated, "Marshall Crosby is a long-time friend and valued associate at the Missouri Botanical Garden. His advice and counsel have been of signal importance in the Garden's development for nearly a quarter century, and they will continue to be of great importance in the future. We look to him to provide the kind of wise advice and perspective that is badly needed as the Garden, now 133 years old, moved forward into the 21st century."

Recalling his 24 years at the Garden, Crosby said, "I was hired by Walter Lewis, who needed someone to work on mosses for the Flora of Panama project. Later, when Peter Raven became director, he made the very good decision to concentrate our research efforts in areas where we already had expertise, and as a result, we have a very find department of bryology today, with a very strong collection of specimens. I feel very fortunate that I have the opportunity to make a real contribution to the study of mosses."

Of the changes at the Garden during his career, Crosby noted that "the scope of our work has gotten broader, of course. When I came there were only a few scientists on staff, and I was looking forward to moving on to someplace else in time. Now, of course, there is no better place to be!"

NEWS FROM THE HENRY SHAW ACADEMY

Winter Classes

The Henry Shaw Academy (HSA) at the Garden offers students ages 4 to 18 exciting ways to investigate the world around them. This unusual program is for students who are interested in exploring the world of science, ecology and natural history. For a course brochure or more information about HSA programs call 577-5140 or 577-5135. Enroll soon, because class sizes are limited.

PITZMAN NATURE STUDY
AGES 4 TO 6

Land of the Cactus
November 14
Session A: 10:30 a.m. to noon
Session B: 1:30 p.m. to 3:00 p.m.

Seasons at the Garden—Falling into Winter
November 21
Session A: 10:30 a.m. to noon
Session B: 1:30 p.m. to 3:00 p.m.

AGES 7 TO 9

Beaks, Bugs, and Beasties
November 21
(Bring a friend for FREE option available.)
10 a.m. to 2 p.m. at Shaw Arboretum

Family Class: Adventures from Dusk to Dark
December 5
2 p.m. to 6 p.m. at Shaw Arboretum

Family Class: Annual Wreath Making
(Bring a friend for FREE option available.)
December 19
9 a.m. to noon at the Garden

AGES 10 TO 12

Pinhole Photography: Explore the Garden with New Eyes
November 21
9 a.m. to noon

Annual Wreath Making
(Bring a friend for FREE option available.)
December 19
9 a.m. to noon

PREVIEW: *Special Programs Highlight January & February*

Rain Forest Ecology

This unique six-part class will focus on the basics of ecology in a tropical ecosystem and explore the Climatron's diverse habitats. In each session we will learn more about tropical forests and their existing diversity. Our goals will be to discover more of the Climatron, learning the secrets and complexities of rain forest ecology as well as human demands, problems with deforestation, and loss of biodiversity. Our last classes will focus upon solutions and ways that we can help preserve rain forest habitats and help rain forest dwellers. Students will receive a notebook and an assortment of information. In our final class (Sunday, February 21, 1993) the students will act as "Climatron Guides" for children in a special day devoted to the tropics and orchids at the Garden.

6 Sessions:

continued on next page

Darwin's "Abominable Mystery" Investigated at Garden Symposium

Search for Earliest Flowering Plant Revolutionizes Plant Science

SOME 450 botanists from around the world gathered at the Missouri Botanical Garden October 2-3, 1992, for the Garden's 39th annual Systematics Symposium to debate revolutionary new data on plant origins. "This is the first time this information has been presented in the United States," said Dr. Mick Richardson, manager of Graduate Studies at the Garden and organizer of this year's symposium. "It was very exciting—there were a few gasps and a few raised voices."

The central question is how and when flowering plants, or angiosperms, evolved. The Earth once was dominated by ferns, conifers, cycads and gymnosperms, ancient plants that rely primarily on wind pollination. The advent of flowering plants, which are pollinated more efficiently, dramatically changed the ecological balance as they came to dominate the face of the globe.

Scientists have long disputed which flowering plant developed first. The answer has enormous implications for science, including the evolution of insects and other pollinators. Recent discoveries using advanced techniques of chemical analysis, DNA sequencing and the method of interpreting this data, called cladistics, has provided botanists with solid insights that may require some radical rethinking of accepted ideas. Meanwhile, the debate rages whether the first flower was magnolia-like, or perhaps an early black pepper plant, a water lily, or a flowering hornwort.

One conclusion that many botanists now agree on is that flowering plants probably appeared in the Triassic period 200 million years ago, instead of during the Cretaceous period 130,000 million years ago, as was long believed.

Participants in the symposium included: (top row, from left): Mitchell L. Sogin, Marine Biology Lab, Woods Hole; James A. Doyle, University of California, Davis; Michael J. Donoghue, University of Arizona; Peter R. Crane, Field Museum of Natural History, Chicago. (Bottom row, from left): Peter H. Raven, MBG; Kevin C. Nixon, Cornell University; Victor A. Albert, University of North Carolina; Brent D. Mishler, Duke University; P. Mick Richardson, MBG.

"We are delighted to host such adistinguished gathering," said Peter H. Raven, director. "This is the first time in plant science that such a group of scientists has come together, and their data may change some longstanding views."

HSA CLASSES continued

January 19, 26, February 2, 9, 16
4 p.m. to 6 p.m.
February 21 (Sunday): 2 p.m. to 5 p.m.

Wake Up to Orchids

In addition to the rain forest program, there will be classes for ages 7-9 and 10-12 that coincide with the Garden's annual Orchid Show January 16–February 14. Orchids are among the most bizarre and beautiful types of plants in the world. We will visit the Orchid Show to study all of the amazing types of orchids on display and discover ways that these plants are useful to people. Each student will take home an orchid with care instructions. Bring a box with a lid to carry your orchid home.

Ages 7-9
January 23, 9 a.m. to noon
Ages 10-12
January 30, 9 a.m. to noon

New Videos Teach "The Biology of Plants"

The Garden has completed the production of a new set of six video programs for lower elementary classes, entitled *The Biology of Plants*. This series is the second set of programs produced by the Garden. The first set, *Life Habitats*, is now used in over 6500 elementary schools in the United States. The Garden's Education Division collaborated with Herb Halprin Productions in the creation of both projects. The new series uses a similar format to the first and shows young children as they investigate plants and the environment. *The Biology of Plants* includes:

- *"How Plants Grow"* Children discover that plants are living and that all living organisms have common characteristics. The children learn how seeds germinate, and what seeds need for germination.
- *"How Plants Get Food"* Helps children understand the ways that plants get water and nutrients from the soil and air, and has plants use those nutrients to make food.
- *"What Is Pollination?"* Introduces the basic structure and function of flowers and helps children learn the ways flowers are pollinated.
- *"How Seeds Get Here . . . and There"* Children investigate seed dispersal and discover that the structure of seeds is related to their dispersal methods.
- *"How Plants Live in Different Places"* The ways that plants have adapted to desert and rain forest habitats are investigated.
- *"Plants and Life on Earth"* Focuses on the important role plants play in the ecosystem.

The videos come with teachers' guides that include descriptions of the science concepts introduced in the videos and suggest classroom activities that teachers can do after using the programs. Information on the purchase of the video series is available from MBG Video at 1-800-927-9229.

New Horticulture Manager

Boyce Tankersley

In September, Boyce Tankersley joined the Garden staff as horticulture manager. Tankersley comes to the Garden from Galveston, Texas, where he had been superintendent of grounds at the University of Texas Medical Branch since 1988.

As horticulture manager, Tankersley supervises some 30 grounds and greenhouse horticulturists. He is deeply involved with the day-to-day operations of keeping the Garden displays beautiful for the Garden's visitors.

''Boyce brings with him a great deal of expertise and enthusiasm,'' says Dr. G. Shannon Smith, the Garden's director of horticulture. ''After a nationwide search we are very pleased to have Boyce on board to help the Garden become even more beautiful and educational.''

Prior to working for the University of Texas Medical Branch, Tankersley was landscaping supervisor for Newell and Newell Business Park in Fort Worth, Texas. He has a Master of Science in floriculture from Texas A&M University and a Bachelor of Science in horticulture from New Mexico State University. He also holds a diploma in General Horticulture, Stage I, from the Royal Horticulture Society of Great Britain.

''I have always wanted to work for a botanical garden and am thrilled to join one of the country's best,'' says Tankersley. ''There is a great deal of creativity and experience among the staff, and I look forward to working with them to put their good ideas to work.''

Alicia Ivory House Honored at "Salute to Excellence"

SEPTEMBER 10, 1992, the Fifth Annual ''Salute to Excellence'' Awards were presented at a dinner at the Clarion Hotel, sponsored by the *St. Louis American*. Alicia Ivory House, magnet school coordinator and instructor at the Garden, received the Merit Award for Math & Science Educators, secondary school level.

House, who joined the Garden staff in 1989, was recognized for her innovative teaching methods and for her pioneering work in organizing last year's All-City Middle School Science Fair, which was held at the Garden. The Fair was organized with the help of the Garden, the St. Louis Regional Science and Technology Career Access Center (RCAC) and the St. Louis Public Schools. Plans are underway to hold the Fair again this school year.

In 1987 House was named one of the top six science teachers in the St. Louis Public Schools. The following year she was featured in *American Teacher*, the official publication of the American Federation of Teachers, for her work as science lab coordinator and department head at Stowe Middle School, which was named one of the six top middle schools in the nation.

House is recognized for her innovative teaching methods that take the mystery out of learning about science. ''I want students to understand that science is part of their everyday lives,'' she says. She is a firm believer in recognizing and encouraging students' enthusiasm and accomplishments, helping them to see careers in science as a viable option.

House and her husband Michael Johnson, who also is a science educator, have two sons, Robert and Malcolm. She earned her bachelor's degree in secondary education from Southern Illinois University at Edwardsville, and she is a master's candidate in environmental education at Maryville.

Butterfly House To Highlight the Garden

The Board of Trustees has approved the addition of a Butterfly House to the Garden's Master Plan. The 24,000 square-foot complex will house exotic butterflies, moths and other insects in a beautiful natural setting. The site of the new display conservatory, to be built some time in the future, is planned for the area north of the Center for Home Gardening.

''A Butterfly House is a natural feature for the Garden, since it fits in so completely with our traditional focus on conservation,'' said Peter H. Raven, director. ''This will be a living demonstration of animals interacting with plants, each ensuring the other's survival by providing food, protection and shelter for the insects, and pollination for the plants. These relationships have a profound impact on sustaining the natural world, and if we are to be successful at conservation we must develop this basic understanding. I cannot think of a more exciting way to present this information to children and adults.''

The Butterfly House, designed by Environmental Planning and Design of Pittsburgh, includes a display house, an interpretive theatre with 120 seats, exhibit space, gift shop and an outdoor cafe.

Garden scientists studied similar programs in the United States and throughout the world to develop the design of the display conservatory. Butterflies require a carefully controlled climate to remain active and healthy. Temperatures must be regulated to between 75 and 90 degrees. Light is critical, since butterflies use the sun to navigate while flying and supplemental artificial light can affect their flight activity adversely. Because butterflies fly in looping, swooping patterns, the new display will be a large, free standing area without internal columns, bracing or corners.

The new structure will resemble a greenhouse conservatory, to allow for tall trees and plants to thrive. Butterflies like to swoop down from a height, so portions of the house will rise 30 to 40 feet in the air. Because humidity is also a key requirement, with a preferred range between 60 and 70 percent, the display may include moving water, a pond or waterfall.

The construction schedule for the new Butterfly House will depend on future funding.

Compton James Tucker Receives Henry Shaw Medal

Dr. Tucker receives the Henry Shaw Medal from O. Sage Wightman III, president of the Board of Trustees.

On Monday, October 19, 1992, the annual Henry Shaw Dinner was held at the Ritz-Carlton St. Louis. The dinner honors the Garden's Henry Shaw Associates and Garden Fellows. The highlight of the evening is the presentation of the Henry Shaw Medal, which is awarded to individuals who have made a significant contribution to the Missouri Botanical Garden, botanical research, horticulture, conservation or the museum community.

The 1992 Medal was presented to Dr. Compton James Tucker. Dr. Tucker, senior fellow at NASA/Goddard Space Flight Center, is honored for his groundbreaking studies of global ecological problems using complex satellite data. He is an internationally recognized authority on the use of remote sensing for monitoring vegetation, continental land cover and meteorological processes.

At NASA Dr. Tucker leads a research group studying biomass burning, desertification in Africa and tropical deforestation. His research will lead to improved understanding of global climate by furthering knowledge of Earth's biosphere and its interaction with the atmosphere. These studies provide vital information about the Earth and aid in planning future satellite sensors and spacecraft.

Dr. Tucker has been with NASA since 1975. His work has greatly influenced the international ecological community and has been featured in *Science, Nature, Bioscience* and other prominent journals.

Horticulture in Missouri

It's A Desert Out There

Henry Shaw was particularly interested in cacti and succulents, and displays of these unusual plants were popular at the Garden during his lifetime. This year the annual Fall Flower Show pays tribute to the fascinating plants of the American Southwest. Instead of the usual chrysanthemum show, the Horticulture staff has decided to create a display to take advantage of some of our plant collections that are held behind the scenes and rarely viewed by the public.

In researching the collections, the staff found that a large number of our cacti and succulents are species from the vegetatively rich area of southern Texas. This flora is characterized by desert, shrub and prairie species such as cactus, agave, sage, grasses and many other drought-tolerant plants. The interior of southwest Texas can be a harsh and dry place, receiving about 15 to 30 inches of rain annually. Many of the plants have evolved succulent stems or leaves, while others have developed thick waxy coverings or a cloak of hairs; both adaptations help lessen water loss and allow the plants to tolerate the warm, often dry environment. Spines, stiff hairs or prickles may be defense against being eaten by animals scouring the dry landscape for food.

The flora of this area is interesting in its own right, but it is also of historical significance to the Missouri Botanical Garden. Our herbarium houses some of the earliest plant collections from the region, and one set of collections, made by Ferdinand Lindheimer, is of particular importance. Lindheimer had taken botany courses in his native Germany before arriving in America in 1834. He came to St. Louis, as did many German immigrants of the day, on his way south to Mexico and Texas. He began sending dried plant specimens to Dr. George Engelmann, a St. Louis medical doctor and botanist who later served as Henry Shaw's botanical advisor. Both Engelmann and Lindheimer were intrigued by the flora of southwest Texas, which had only been studied by a few botanists and was largely unknown. After sending Engelmann a number of herbarium specimens, Lindheimer was encouraged by Engelmann and Asa Gray to continue his collections.

In 1843, Lindheimer began collecting in earnest and shipping his collections to St. Louis. One shipment never arrived. However, the over 1,400 collections that did arrive from 1843 through 1851 represent a treasure of botanical information. Besides being a record of the flora of that period of time, many of the plants collected by Lindheimer were new to science. These species were subsequently described and named by Engelmann, Gray or other specialists, and many bear Lindheimer's name.

For instance, *Opuntia lindheimeri*, a prickly pear cactus, was described by Engelmann from one of Lindheimer's collections near New Braunfels, Texas, where Lindheimer built a cabin. Just a few of the many other species named in honor of this great collector are: *Cassia lindheimeriana*, a shrubby desert legume; *Croton lindheimerianus*, a member of the family Euphorbiaceae; and the star daisy, *Lindheimera texana*.

After Engelmann's death in 1884, his magnificent personal herbarium collection of 98,000 specimens was given to the Garden. Lindheimer's collections are now one of the valuable historical collections of our native flora that are held for study in the Missouri Botanical Garden herbarium.

Come to the fall show November 6-29 to enjoy a bit of southwest Texas and a slice of MBG history. See *Calendar of Events*, page 12.

—Lucile McCook, Ph.D.
Horticultural Taxonomist

Trees & Yard Waste

Now that Missouri State law bans yard waste from non-composting landfills, we homeowners are faced with learning new ways to cope with our annual avalanche of leaves, grass clippings, weeds and branches. One of the smartest things to do is to plan your landscape to include trees that minimize maintenance and yard litter in the first place.

Evergreen trees are relatively free of problems, rarely need pruning and drop their needles over long periods, making them good for low maintenance landscapes. An exception is the Scotch pine, which is very susceptible to a lethal disease called pine wilt. It is not recommended in Missouri.

With deciduous trees the choices are not so clear. You may want to consider such maintenance characteristics as messy fruit and bark, heavy pruning needs, weak branches, or a predisposition to disease and pests. Here are a few pros and cons of some popular trees, and some less well known recommendations.

PROS AND CONS

Ashes Commonly planted as shade and street trees. Green ash has a fast growth rate. Winged fruit is produced in large numbers, producing a weed and disposal problem. Some seedless cultivars of green ash are available: "Marshall's Seedless" or "Dakota Centennial." Cultivars of white ash have better autumn color. Brittle twigs, susceptibility to insects and diseases generate dead branches requiring pruning, cleanup and overall higher maintenance.

Birches Intolerant of heat and dry soil, especially if planted in full sun. Stressed trees are more susceptible to bronze birch borer attack. River birch, a Missouri native, is more heat tolerant and resistant to borers. Although wood is somewhat weak and easily damaged by storms, it is superior in wet areas. River birch cultivar "Heritage" is an excellent upright tree requiring little maintenance.

Buckeyes and **Horsechestnuts** Belong to the same genus, noted for upright flower clusters produced in late spring. All produce large spiny fruits, causing serious problems with litter, collection and disposal. Also prone to fungal disease called leaf blotch; should not be planted on dry sites.

Catalpas Both southern and northern types are grown in Missouri; northern is native. Both are subject to verticillium wilt: causes dieback of major branches or the entire tree. Large leaves and elongated pods require hand cleanup. Pods are extremely resistant to decomposition.

Cherries Often chosen for lovely spring bloom and shiny bark. Many are plagued by insects and diseases and should not be expected to be long-lived. Thin bark is subject to frost cracks, fungal canker diseases and borers. Sargent cherry is least troubled by these problems. Black cherry is native, but susceptible to disease and pests. Berries are messy, but welcome to birds.

Chestnuts American Chestnut dominated eastern forests before fungal disease called chestnut blight. The Chinese chestnut is not a replacement, but is resistant to blight and can be used as a shade or specimen tree. Flowers are welcome in June, but spiny fruits are messy.

Crabapples A top ornamental choice. Older varieties are commonly plagued by fire blight, apple scab, powdery mildew and rust. Newer varieties should be chosen on the basis of resistance to disease as well as for ornamental features. Fruit can be messy. Prune as little as possible to avoid suckers, which form readily.

Elms Rock, slippery (red) and American elm are very susceptible to Dutch elm disease. Siberian elm, though drought tolerant, is subject to storm damage and winter kill. Chinese or lacebark elm is resistant to disease, somewhat susceptible to storm damage but a beautiful tree planted for its ornamental bark. Smoothleaf elm also resistant to elm disease. All elms are subject to elm leaf beetle.

Hawthorns Beautiful landscape trees, a source of food for birds and adaptable as screens, hedges and borders where thorns are not a problem. Subject to cedar apple rust, requiring fungicide applications in spring and summer. Also susceptible to fire blight, powder mildew, scab and leaf spot diseases. "Winter King" has excellent rust resistance, outstanding flowers and fruit and few thorns.

Honeylocusts Commonly chosen as a fast growing street tree. Particularly tolerant of dry, compacted soils. Common honeylocusts have thorns on their trunks and should be avoided. Thornless honeylocust is a superior choice where light shade is desired. Turf will grow well under these trees. Pest problems include mimosa webworm and green bug, which are more serious in certain years. Fruit pods require hand cleanup. Pod-less varieties "Imperial," "Majestic" and "Moraine" are available.

Magnolias On the edge of hardiness in Missouri, subject to frost injury requiring corrective pruning. Fairly pest- and disease-free, create little yard waste. An exception is grand magnolia, with large leathery leaves which are continuously shed and resist decomposition.

Maples Only a few should be avoided. Maples with fast growth rates tend to have weak wood. Branches and twigs of silver maple require frequent cleanup. Boxelder maple is very brittle and should never be planted where safety is a factor. Amur, black, hedge, red, sugar and tatarian maples are fairly maintenance-free with only minor disease and pest problems. Norway maple is tolerant of poor sites and makes an excellent street tree.

Mountain Ashes Planted for colorful fruit display in late summer and for ornamental bark. European and Korean mountain ash have some significant problems including fire blight, rust, scale and borers. Korean mountain ash is less susceptible to borer damage and branch dieback. Neither should be planted as a street tree nor expected to be long-lived.

Mulberrys Notorious for messy fruit, a source of food for birds. Common and red mulberry seeds germinate readily into numerous weed seedlings. Non-fruiting cultivars of common mulberry are available and should be used where possible. Roots are aggressive and can clog drains.

Oaks Tend to be slow growing, strong wooded and long-lived. Many are native to Missouri and have excellent fall color. Many oaks keep some foliage throughout winter, prolonging cleanup, notably laurel oak and pin oak. Oak leaves are slow to decompose, increasing composting time. In certain years acorns can be very plentiful, creating a nuisance in traffic areas, requiring persistent collection. Acorns resist decomposition. Oak wilt, a fungal disease affecting most black and red oaks, is a serious problem in the midwest. White oaks are susceptible to a lesser degree.

Poplars Fast growing trees with many problems, should be planted only with caution. Brittle wood is easily damaged by ice and wind. Fungal cankers are prevalent. Root system is very aggressive and can cause problems with sewer lines and uplifting of sidewalks.

Other Trees Sycamores and London planetrees produce exfoliating bark and seed balls that are messy to clean up; both are also subject to storm damage. Sweetgum is notorious for its seed balls, which resist decomposition. Willows and tree-of-heaven have weak wood, subject to wind damage. Russian olives are tolerant of drought and infertile soils but subject to extreme disease problems and should be avoided. Walnuts produce large messy fruit that must be removed by hand. Squirrels are preoccupied with burying walnuts, and seedlings frequently come up in landscape beds. Redbud seeds germinate readily, creating weed problems.

BEST TREES

While it is true that there are problems with any tree, here are a few which have many positive characteristics and contribute very little to yard waste.

Downy Serviceberry Requires very little pruning, and birds eat the fruit before it drops.

Corneliancherry Dogwood Early spring flowering tree with attractive bark and small berries which attract birds.

Goldenraintree Mid-summer flowering; seed pods are attractive and decompose easily.

Zelkova Resistant to Dutch elm disease. Drops all its leaves at one time; no fruit or twig litter.

Flowering, Pagoda and Kousa Dogwood All make nice specimen trees of medium to small size. Should be planted in good soils and protected from hot afternoon sun and drying winds. Some pest and disease problems can occur, but good cultural care and planting in the right location will minimize this.

Common and Sugar Hackberry Excellent for large areas. Medium to rapid growth with relatively few pest or disease problems beyond insect galls, which are not cause for concern. Sugar hackberry is less hardy.

Ironwood Medium-sized, useful as a shade or street tree, tolerant of full sun to partial shade. Considered low maintenance with no serious insect or disease problems.

Hornbeam American and European hornbeams are low maintenance medium-sized trees with few pest or disease problems. American hornbeam is hardier than the European, tolerates more shade and has better fall color. Both are low maintenance.

Katsura Tree A medium-sized tree with rich, attractive foliage and sometimes a multi-stemmed trunk. Flowers are not showy and fruit is small. Should be planted out of afternoon sun, where they will get plenty of water all season. Especially prone to drought stress, which shows up as scorched leaves in mid-summer and can be unsightly and cause early defoliation. Otherwise these trees have very few insect or disease problems and are considered low maintenance.

Littleleaf and Silver Linden Both make good street trees, able to withstand adverse soil conditions. They have few insect or disease problems. Silver linden is more tolerant of hot, dry sites and air pollution.

Tulip Tree A big tree, sometimes reaching 100 feet or taller. Grows relatively fast when planted in deep, moist soils. Only minor problems, none of which cause significant maintenance. An excellent shade tree with an abudance of large handsome leaves.

—Steven D. Cline, Ph.D.
Manager, Kemper Center for
Home Gardening

Master Composter Program

If you're feeling overwhelmed about now with a deluge of autumn leaves and grass clippings, don't despair! The Garden's Master Composter Program is here to help answer the many questions raised by the new State law forbidding yard waste in non-composting landfills.

Supported by Monsanto Fund, the Master Composter Program at the Kemper Center for Home Gardening teaches volunteers how to manage home yard waste. The volunteers then give demonstrations and seminars in composting techniques throughout the community. To date, about 100 Master Composters have completed the 12-hour course and have instructed more than 3,000 people in local communities.

In addition, the program has constructed three demonstration sites in the area: Carondolet Park adjacent to highway 55 in St. Louis City; downtown Kirkwood across from the train station; and Warson Road just north of Olive in Creve Coeur. At each site a selection of homemade and commercial backyard composters are on display, including simple wire bins, wood-and-wire bins, turning units and tumblers. Information handouts are available on each unit, describing its features, suppliers and costs. A central kiosk provides basic information on composting.

Every Saturday through November 21, Master Composters will be on hand from 11 a.m. to 1 p.m. at each site. If you can't visit, call the Master Composter Hotline at the Garden, (314) 577-9555, Monday through Friday, 9 a.m. to noon. Questions after hours can be left on a recorder and will be returned.

Master Composter
Hotline: 314/577-9555

The Kirkwood demonstration site.

MASTER
COMPOSTER
Missouri Botanical Garden

NOVEMBER

5-7 THURSDAY SATURDAY

Holiday Preview Sale
See page 13 for details.

6 FRIDAY

Members' Preview, Fall Flower Show
5 to 8 p.m., Ridgway Center. Entertainment, cash bar; Garden Gate Shop Preview Sale will be open; dinner buffet available in Gardenview Restaurant. Be among the first to see this spectacular new show of cacti and succulents and preview the exhibit below. For members only. *See highlight.*

7 SATURDAY

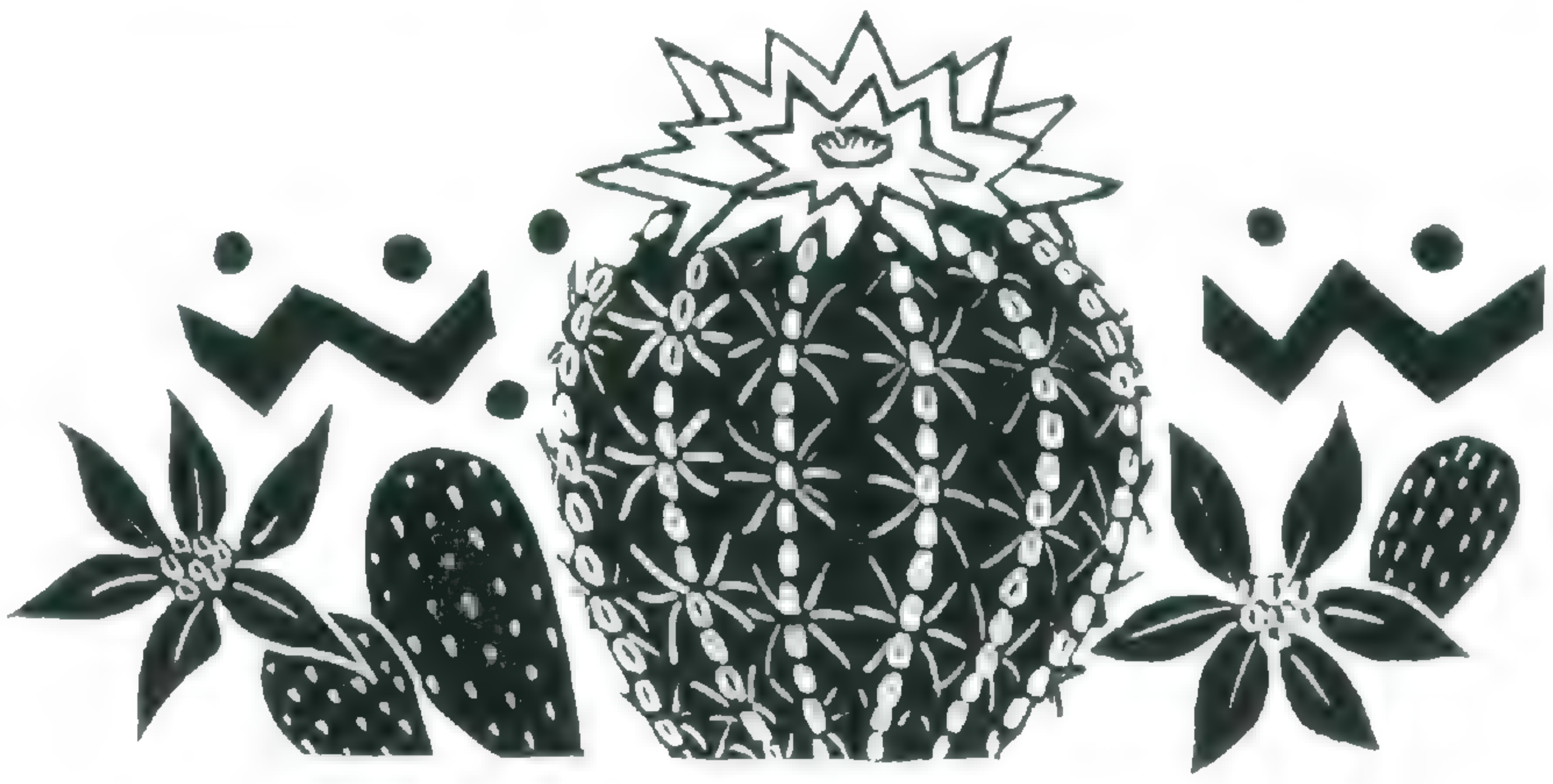
Exhibit: "Plant Studies from the American Prairies"
9 a.m. to 5 p.m. daily through November 29, Monsanto Hall, Ridgway Center. Drawings of American prairie plants by George Olson, Missouri Botanical artist-in-residence during the fall of 1992. Olson's work captures plants in different stages of growth, from full flower to the end of their cycle in winter. Free with regular Garden admission.

Master Composter Saturday Programs
11 a.m. to 1 p.m., at three St. Louis locations: Carondelet Park; Warson Road just north of Olive; downtown Kirkwood across from train station. Master Gardeners will be on hand to demonstrate how to manage yard waste. *See page 11.*

13-15 FRIDAY-SUNDAY

"The Very Last Green Thing"
7 p.m. Friday; 3 p.m. Saturday and Sunday; Shoenberg Auditorium. Opera Theatre of St. Louis presents Cary John Franklin's specially commissioned new opera for young people, "The Very Last Green Thing." Instructional materials by the Garden's Education Division will accompany the performances. $6 for adults, $4 for children under 13; call 961-0644 for tickets.

Missouri Botanical Garden
CALENDAR OF EVENTS
November-December 1992



NOVEMBER 7-29 / Fall Flower Show "Desert in Bloom"

9 a.m. to 5 p.m. daily, Orthwein Floral Display Hall. A spectacular new show comes to the Garden! A salute to the plants of the desert Southwest, featuring cacti, succuluents, grasses, flowering shrubs and annuals in a quiet adobe courtyard with tiled roofs and a fountain. *Members' Preview: See November 6.*

DECEMBER 12-JANUARY 1 Holiday Flower Show "A Sparkling Season"

9 a.m. to 5 p.m. daily, Orthwein Floral Display Hall. Ring in the holidays with a charming display of animated elves gardening in a wonderland of seasonal plants, including stargazer lilies, narcissi, gloxinias, poinsettias, cyclamen, begonias, boxwoods and more. *Members' Preview: See December 11.*

NOVEMBER continued

14 SATURDAY

Master Composter Saturday Programs
11 a.m. to 1 p.m., three locations. *See November 7 for details.*

21 SATURDAY

Master Composter Saturday Programs
11 a.m. to 1 p.m., three locations. *See November 7 for details.*

DECEMBE

2 WEDNESDAY

Candlelight Tour
4:30 to 7:30 p.m., Tower Grove House. *See page 15 for details.*

4 FRIDAY

Tower Grove House Holiday Luncheon
11:30 a.m. to 12:45 p.m. *See pa for details.*

7 MONDAY

Tower Grove House Holiday Luncheon
11:30 a.m. to 12:45 p.m. *See pa for details.*

8 TUESDAY

Tower Grove House Holiday Luncheon
11:30 a.m. to 12:45 p.m. *See pa for details.*

10 THURSDAY

Tower Grove House Holiday Luncheon
11:30 a.m. to 12:45 p.m. *See pa for details.*

Kemper Center for Home Gardening
Open 10 a.m. to 4 p.m. daily Plant Doctor available 10 a.m. t noon and 1 to 3 p.m. Monday through Saturday. Free with regular Garden admission.

WALKING TOURS Every Tuesday, Saturda and Sunday 1:00 p.m.
Join the Garden Guides fo tour of the grounds, featuring the art, architecture, history and horticulture of the Garde Meet at the ticket counter in Ridgway Center. Free with regular Garden admission.

ECEMBER continued

0-12 THURSDAY-SATURDAY

liday Plant Sale

e this page, below, for details.

1 FRIDAY

embers' Preview,
liday Flower Show

o 8 p.m., Ridgway Center. Enter-nment, cash bar; Garden Gate Shop Plant Sale will be open; dinner buffet available in Gardenview Restaurant. Enjoy a sparkling presentation of gemstones and beautiful watches from the fabulous collection of Albarré Jewelry of Ladue. Win an attendance drawing for an exquisite piece of jewelry custom designed by Albarré Jewelry. For members only.

Tower Grove House
Holiday Luncheon

11:30 a.m. to 12:45 p.m. *See page 15 for details.*

14 MONDAY

Tower Grove House
Holiday Luncheon

11:30 a.m. to 12:45 p.m. *See page 15 for details.*

MEMBERS' EVENTS

NOVEMBER 14
Members' Day
Desert House Tour

10 a.m. to 2 p.m. Continuous guided tours of the historic Desert House, home to the Garden's collection of cacti and succulents. Receive a free brochure on the horticulture and care of these extraordinary plants, including the Christmas cactus and poinsettia. Free, for members only.

DECEMBER 19
Members' Day
"Voyage of the Red Hat"

11 a.m. and 2 p.m., Shoenberg Auditorium. The Imaginary Theatre Company of the Repertory Theatre of St. Louis performs a dramatic rendition of this beloved Irish folktale, adapted by Connie Congdon. Due to limited seating, tickets are required and will be available at the ticket counter in the Ridgway Center beginning at 9 a.m. the day of the performance. Free, for members only.

From the Garden Gate Shop

Holiday Preview Sale

November 5 through 7, 1992
Thursday: 9 a.m. to 7:30 p.m.
Friday: 9 a.m. to 8 p.m.
Saturday: 9 a.m. to 5 p.m.

Celebrate the 100th anniversary of the Nutcracker Suite with our splendid array of holiday nutcrackers, ornaments and decorations. Pick up a wide variety of gifts including books, blooming plants, toys, jewelry and more.

20% Members' Discount
All Three Days
Refreshments will be served.

Holiday Plant Sale

December 10 through 12, 1992
Thursday: 9 a.m. to 7:30 p.m.
Friday: 9 a.m. to 8 p.m.
Saturday: 9 a.m. to 5 p.m.

Poinsettias, Christmas Cacti, Norfolk Island Pines, Miniature Decorated Trees, plus Bulbs for Indoor Forcing: Amaryllis, Paperwhites and Hyacinths. Gifts for the garden include Bird Feeders, Sundials, and Musical Chimes, plus Books, Stationery and More!

20% Members' Discount
All Three Days
Refreshments will be served.

Books, Books, Books

The Gate Shop has the finest selection of gardening books in the area, and this holiday season the Shop is featuring Hearst Garden Guides from William Morrow & Co.:

Bulbs, by John E. Bryan
Photographs by Andrew Lawson
192 pages, over 200 color photos plus illustrations, map, index. $25 in hardcover.

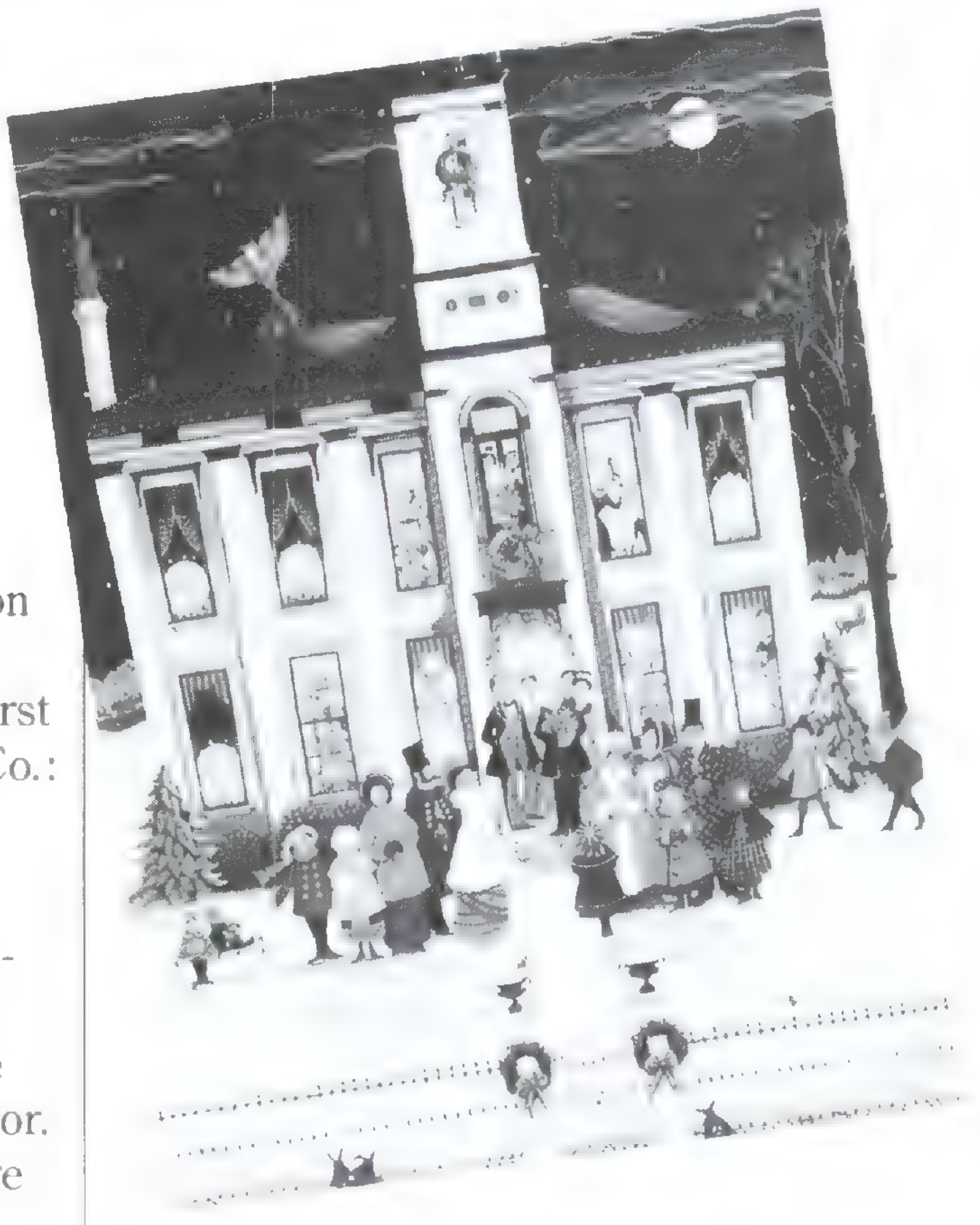
An indispensable guide and reference book to growing bulbs for year-round color. Illustrated encyclopedia section lists more than 200 species of bulbs.

Trees & Shrubs, by William Thomas
Photographs by Andrew Lawson
208 pages, over 200 color photos plus illustrations, map, index. $25 in hardcover.

Mr. Thomas, director of education at Longwood Gardens, gives a comprehensive review of more than 500 plants plus the basics of planting, nurturing, and pruning.

A World of Plants:
The Missouri Botanical Garden

A magnificent book celebrating the history, displays and research at the Garden with essays by noted botanists and historians. Sumptuously illustrated with 158 plates, 125 in full color. $39.95 in hardcover. Harry N. Abrams, Inc.



1992 Holiday Card

The Garden's 1992 Holiday Card features a festive look at Tower Grove House by local artist Ann Thompson. This charming full color card comes with 12 cards and 13 envelopes per box, for $12.

1993 Garden Calendar

A wonderful gift for anyone who loves the Missouri Botanical Garden! Glorious 16 x 12-inch color photographs by Jack Jennings share the beauty of the Garden every day of the year. Printed on recycled paper. $10.95, less 10 percent members' discount, plus postage if you wish to have your gift shipped for you.

1993 MEMBERS' TRAVEL PROGRAM

Costa Rica

MARCH 13 TO 22, 1993
Experience a world as lush as any that has ever flourished on earth. Over eight percent of Costa Rica is dedicated to national parks, preserving its unique flora and fauna. Travel from the active volcano at Volcano Poas national park to the Jardines Lankester, a botanical garden that boasts more than 800 species of orchids. Visit the 500-acre Selva Verde natural area, with its breathtaking variety of forest wildlife living in their natural habitats. Take a canoe trip down the beautiful Sarapiqui River, visit Wilson Botanical Gardens, home to an internationally known collection of tropical plants, and enjoy the lovely white sand beaches of Manuel Antonio National Park, where monkeys leap along the paths. The trip is led by Dr. Barry Hammel, who lives in Costa Rica and supervises the Garden's research activies there.

Madagascar

APRIL 2 TO 16, 1993
Madagascar, a spectacular island off the east coast of Africa, is one of the world's biological treasures. It is home to one of the world's richest, most diverse, and highly threatened tropical floras. Nearly three quarters of the island's 10,000 plant species are found nowhere else in the world, including almost 1,000 orchids and a tremendous range of beautiful and bizarre succulents. Visit areas of pristine rain forests and spectacular spiny desert, walk nature trails to see exotic lemurs and birds in natural habitats, enjoy beautiful beaches, and see first hand the Malagasy conservation projects developed in collaboration with the Missouri Botanical Garden. This tour will be led by Dr. George Schatz, the Garden's resident botanist in Madagascar.

Austria, Switzerland, Alsace and the Rhine Valley

AUGUST 10 TO 23, 1993
Take a romantic journey to Europe's historic cultural heartland and see some of the world's most beautiful gardens. Visit Vienna, home of the Habsburgs and Schonbrunn Palace; travel by train to Salzburg, Mozart's birthplace, where you will be treated to a special opera performance; explore lovely Mirabell Gardens and the magnificent mountain region where the Trapp family left their legacy of the "Sound of Music." A picturesqe journey through Bavaria and a tour of King Ludwig's sumptuous island palace leads to historic Munich, followed by a visit to Lindau and Lake Constance. On to Switzerland, including St. Gallen Abbey and Lucerne; then drive through Germany's Black Forest to Strasbourg, starting point for a cruise down the legendary Rhine to Heidelberg and Cologne. This once-in-a-lifetime trip will be led by Brian and Brenda Ward, recently retired MBG horticulturists.

Each of these tours offers Garden members a thrilling travel adventure. Enrollment is limited, so plan to register early. For brochures and complete information on costs and deadlines, please call Brenda Banjak at (314) 577-9517.

Thank You!

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Membership Special Save 20%

During the Holiday Plant Sale December 10, 11 and 12, you may purchase a $45 Garden membership for just $36, a savings of 20 percent!

Then enjoy the 20 percent members' discount in the Garden Gate Shop, or give as a gift that will delight family and friends all year long.

NEWS FROM TOWER GROVE HOUSE

A Victorian Holiday

Tower Grove House will be closed for decoration December 1, and will be open to visitors December 2-31, 1992, daily except Christmas Day. Take a trip back in time with a glimpse of Victorian Christmas splendor, 10 a.m. to 4:30 p.m., with the last tour beginning at 4 p.m.

Candlelight Tour

Make your reservations today for the Tenth Annual Candlelight Tour, sponsored by the Tower Grove House Auxiliary, Wednesday, December 2, 1992, between 4:30 and 7:30 p.m. The fee includes a candlelight tour of Tower Grove House, decorated for a Victorian Holiday, plus refreshments in the Tea Room. Parking is available on the Baptist Church lot at the corner of Tower Grove Avenue and Magnolia Avenue. Reservations must be made by mail (use the form below) and must be received no later than November 20, 1992. Call 577-5150 for additional information.

Holiday Luncheons

Special Holiday Luncheons will be served in the Tea Room at Tower Grove House on Friday, December 4; Monday, December 7; Tuesday, December 8; Thursday, December 10; Friday, December 11; and Monday, December 14. Luncheons will be served between 11:30 a.m. and 12:45 p.m. Telephone reservations will be accepted beginning Thursday, November 12, between 9 a.m. and noon, and at the Tea Room between 9 and 11 a.m. Payment must be received no later than November 20, 1992. Luncheons are $12 per person; call 577-5150 for reservations and information.

1992 Candlelight Tour

Please make __________ reservations for the Candlelight Tour, Wednesday, December 2, 1992, at Tower Grove House between 4:30 and 7:30 p.m. Enclosed is my check for $__________, at $7.00 per person. Please make checks payable to: Tower Grove House Auxiliary. Check must be received no later than November 20, 1992.

NAME__________________________

ADDRESS__________________________

CITY__________STATE__________ZIP__________

PHONE__________________________

Mail to: Tower Grove House, Missouri Botanical Garden, P.O. Box 299, St. Louis, MO 63166

P · R · O · F · I · L · E

Nancy D'Arcy

THIS fall the Garden's Education Division had to cope without the skills of Nancy D'Arcy, a teacher with the St. Louis Public Schools who had been assigned to the Garden for the past 14 years. This fall Nancy was reassigned to Garfield School as a Chapter I basic skills teacher.

Nancy, who is married to Garden botanist William D'Arcy, worked at the Garden on special assignment to improve the quality of science education in St. Louis. She taught existing classes and designed new ones, worked to integrate Garden classes with the school curriculum, conducted field trips at the Garden, and did activities in the classrooms.

"When I came to the Garden, Ken Peck was head of education," Nancy said. "There was only one other instructor, a few volunteers, and Audrey Neiser, the department secretary, who is still here. The division has grown a lot since then!"

Nancy was involved with a number of innovative programs at the Garden. She wrote *The Garden Explorer,* a folder of activity sheets for children, worked on teacher training workshops, and helped to develop the *Climatron Coloring Book*. Her most recent project with her students was planting tulip bulbs at schools in the fall so they could study their growth throughout the school year. "Hummert Seed Company donated the bulbs," Nancy explained, "and the students and teachers loved it. It gave us a chance to demonstrate the entire year-long cycle of plants. We brought the classes here to see the Garden, which reinforced the things they had learned." Because field trips to the Garden are such an important part of the learning experience, the St. Louis Public Schools asked Nancy to help develop a video to be shown before students visit.

"Nancy made an enormous contribution to our education program," said Larry DeBuhr, director of education. "We will miss her. but we know her students will continue to benefit from her knowledge and commitment."

"Gardens Come to You"

The Missouri Botanical Garden has provided special programs for senior citizens through the Samuel D. Soule Center for Senior Citizens since 1984. In 1993, the Garden will reach out to those who cannot visit the Garden through a new program, "Gardens Come to You."

Portable activities on Japanese Culture, Botanical Illustration, and Color in Nature and Art will be developed and tested in 1993 and 1994. Trained volunteers will present these programs on botanical and artistic themes at senior centers throughout the metropolitan area.

The Garden is grateful to have a grant from The Arts and Education Council of Greater St. Louis to launch this effort.

Ambassador Zhu Qizhen of the People's Republic of China is shown here with Dr. Peter H. Raven, director (left) during a visit to the Garden. The ambassador visited St. Louis in September. The Garden collaborates with scientists in the People's Republic in a number of research projects, including the Flora of China *project.*

From left: Marcia Kerz, director of development; Grace Brumgaugh; and Lawrence P. Katzenstein, Mrs. Brumbaugh's estate planning attorney. Mrs. Brumbaugh's charitable gift annuity with the Garden will yield her an income for her lifetime.

Gift Planning *For Mutual Benefit*

Recently, the Garden was the recipient of a charitable gift annuity contract entered into with a long-time supporter of the Garden, Mrs. Grace Brumbaugh. This type of donation is an example of a gift planning vehicle that produces a life income return for the *donor*, as well as a donation to the Garden. "We are thrilled to have this wonderful support from a good friend of the Garden, and also be able to return an annual income to Mrs. Brumbaugh," said Marcia Kerz, director of development and public relations. "It is the best of both worlds in a very real sense," explained Larry Katzenstein, Mrs. Brumbaugh's attorney and an advisor to many St. Louis charities, "because it allows the donor to continue to benefit from an asset, often greatly increasing the donor's income while at the same time generating a charitable income tax deduction for a portion of it."

The ideal asset to fund a gift annuity with the Garden is a security that is not yielding well. With a gift annuity, the Garden receives this stock and agrees to pay the donor a specified annual income that is usually higher in dollar terms than the income being earned by the stock. In addition, a portion of the annual income is usually tax free for income tax purposes. The donor also receives an immediate income tax deduction for a portion of the gift. If you are interested in receiving more information about charitable gift annuities or other planned gifts, please call Ernestina Short at 577-9532 or write to her at P.O. Box 299, St. Louis, Missouri 63166-0299.

CPC NEWS—The St. Louis Committee to Endow the National Collection at the Missouri Botanical Garden met in September to discuss sponsorship of 13 endangered plants. Seated, from left: Kitty Hoblitzelle, Mary Ott, Patty Bush (chair), Lucile McCook, Susan Klein. Standing, from left: Don Falk, director, CPC; Mary Ann Pitchford, Lu Morse, Mary Wiese, Donna Bruner, Nita van der Werff, Susan Lammert, Jan Mackey, Paul Redfern, Jr. Not pictured: Mary Randolph Ballinger, June Kummer, John and Connie McPheeters, Virginia Miller and Midge Tooker.

Langenbach Gift Enhances Education Resources

This summer Elsie Langenbach honored her late husband, Paul, with a generous gift to the Garden. Mrs. Langenbach's gift extends her lifelong involvement in teaching by funding resources for teachers and children.

"Teachers need just the kinds of resources you have at the Garden. I keep encouraging my young teacher friends to come and see all that you have," Mrs. Langenbach commented on a recent visit. To assure that teachers continue to benefit from these resources, she has designated a portion of her gift for instructional materials that will improve teaching both within the Garden and by teachers throughout the area.

In addition, Mrs. Langenbach has established an endowment to fund future scholarships for children participating in Henry Shaw Academy programs. These funds will provide four to ten full-year scholarships each year to needy children who have a special interest in science.

Garden Club of America Hosts Garden Speakers

More than 100 members of the Garden Club of America met in St. Louis September 25-27, 1992, for their annual Zone IX meeting, hosted by the Ladue Garden Club. Donald Falk, director of the Center for Plant Conservation (CPC), was the keynote speaker.

Falk is co-editor of *Genetics and Conservation of Rare Plants*, a resource guide for plant conservationists. He addressed the garden club members on "Saving Diversity: All Winners, No Losers." Falk reminded the group that many rare and endangered plants are genetically related to food crops or plants with pharmaceutical value, and conserving them is of vital importance for the future.

Dr. Lucile McCook, the Garden's horticultural taxonomist, spoke to the meeting on Saturday on "The Great Experiment: Growing Endangered Species." McCook oversees the collection of rare and endangered plants in protective cultivation at the Missouri Botanical Garden as part of the CPC National Collection.

The Garden Club of America has supported studies on endangered plant species of the U.S. and provides scholarships for graduate students. The Ladue Garden Club has been a longtime supporter of the Garden, contributing to the library, English Woodland Garden and Demonstration Vegetable Garden.

Trustee Profile

Marilyn Fox

At the meeting of the Board of Trustees on May 20, 1992, Marilyn Fox was elected to a two-year term. Mrs. Fox is the volunteer chief executive officer of the Jewish Community Centers Association (JCCA), a St. Louis social service agency with a membership of 12,000 which serves over 30,000 people per year. Mrs. Fox provides leadership and appoints over forty individuals who chair committees involving more than 500 volunteers. She presides over the 60-member JCCA Board of Directors.

Mrs. Fox, a native St. Louisan, is a former member of the Garden's Members' Board. She currently serves on the boards of the Repertory Theatre and Webster University; the Washington University Friends of Music, Advisory Council; the Girls, Inc. "Best Friends" advisory committee, and is president of Webster University's Daniel Webster Society. She is a former officer and board member of the Jewish Federation, and has served on the boards of Hillel, Jewish Family & Children's Services, and the Community Agency for Jewish Education. She is a life member of the National Council of Jewish Women, Hadassah and the Jewish Hospital Auxiliary.

"I am very honored to be serving on the Garden's Board," Mrs. Fox said. "The Garden is one of our city's most wonderful resources, offering so much to the entire community. There is something here for everyone, from education to research to aesthetic beauty."

Mrs. Fox and her husband, Sam, have five grown children, "who all enjoy the Garden!" she says.

OPEN HOUSE—Nearly 450 people toured the John S. Lehmann Building on Saturday, September 12, to get a first hand glimpse of the Garden's research program in action. Visitors toured the library's rare book collection and rare book conservation center, observed the art of plant mounting and talked with Garden plant mounters, tried their hand at botanical illustration, saw a sampling of the Garden's archives, and looked through microscopes while talking with Garden botanists. In the herbarium, visitors saw a display of historical and interesting plant specimens, walked through the compactor and looked at herbarium specimens and saw how the Garden's database, TROPICOS, works. They were even able to print out a nametag with their name spelled in Chinese. The Lehmann Building Open House will be repeated soon to give Garden members and the general public another opportunity to learn more about the Garden's world-renowned research facilities.

IN MEMORIAM

Jane Kuhn Pelton

The Garden lost a longtime friend and supporter with the death of Jane Kuhn Pelton on Tuesday, September 8, 1992. Mrs. Pelton was 95.

Mrs. Pelton, a third generation St. Louisan, will be remembered for her distinguished career and lifelong service to the community. She earned her bachelor's degree from Washington University and in 1922 became one of the first two women to earn a master's degree in architecture from the university. In 1965 she was named a *St. Louis Globe-Democrat* Woman of Achievement.

In addition to her support of the Garden, Mrs. Pelton endowed the Kuhn-Pelton Kidney Unit at Barnes Hospital, and was a benefactor of medical research and architecture scholarships at Washington University.

Library Volunteers are Honored

The sixth annual luncheon in honor of volunteers in the Garden library was held October 21 in the Spink Pavilion. All together the library's 42 volunteers have donated a total of 176 years of service to the Garden. This year 12 new volunteers joined the staff.

Library volunteers help with work in the reference, oral history, conservation, circulation, cataloging and archives units of the library. They provide an invaluable service by creating subject indexes, organizing exchange files, transcribing audiotapes, making boxes and portfolios for delicate books, reshelving books, photocopying for interlibrary loans, filing, and arranging and describing archival collections, among other tasks.

Constance Wolf, Garden librarian, said, "The volunteers are a vital part of the library. The annual luncheon in their honor is a small 'thank you' for a big job well done."

CONSERVATION CENTER CAMPAIGN

In November, 1991, The Kresge Foundation awarded a challenge grant of $500,000 to the Missouri Botanical Garden, to be used to spur gifts still required for the renovation and expansion of the Garden's Conservation Center. Fund raising for this important facility is still underway. We wish at this time to express our gratitude to the following individuals and organizations for challenge contributions made through August, 1992 toward our goal:

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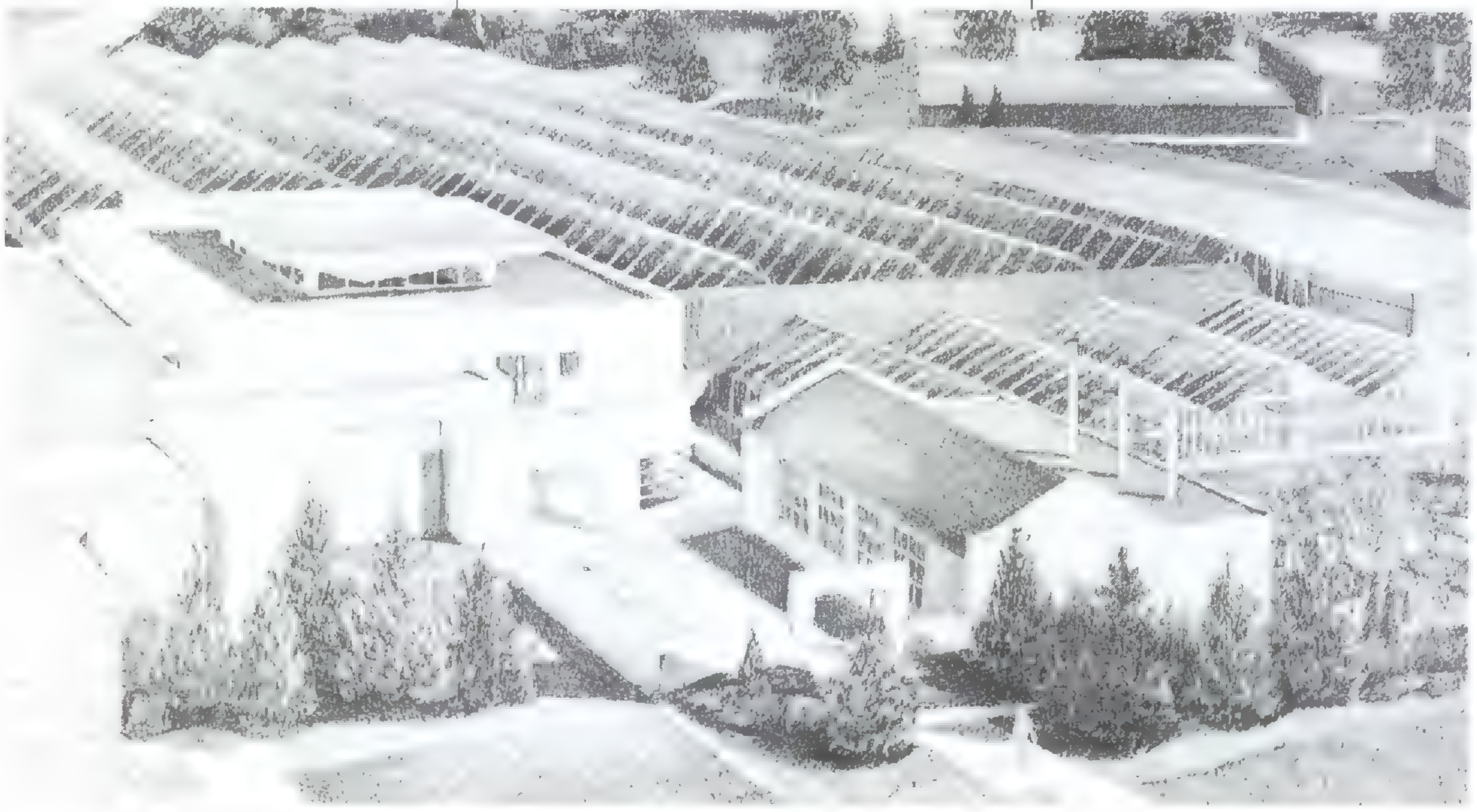
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HOLIDAY CELEBRATIONS

Three holiday celebrations planned especially for families are designed to share and promote cultural exchange. Reservations are required for some workshops; call 577-5125 beginning November 16. Regular Garden admission.

CHRISTMAS

Saturday, December 12, 1992
11 a.m. to 4 p.m.

Santa, carollers, musicians holiday cooking demonstrations and the Holiday Flower Show are just a few of the activities that will make this a fun filled day of holiday celebrations. Photos with Santa, for a small fee, will help frame the memory of this delightful celebration.

CHANUKAH

Festival of Lights

Sunday, December 20, 1992
11 a.m. to 3 p.m.

Traditional Jewish music and folkdancing will give visitors an opportunity to share in this holiday celebration. Puppet shows, storytelling and more surprises will make this a special holiday for children as well. Co-sponsored by the Jewish Community Centers Association and the Central Agency for Jewish Education.

KWANZAA

Day of Kujichagulia: "Self-Determination"

Sunday, December 27, 1992
11 a.m. to 5 p.m.

Kwanzaa, a holiday that pays tribute to the rich cultural roots of Americans of African ancestry, will be celebrated on the second day of this week of festivities. A market featuring African attire and literature, family workshops, cooking demonstrations and a traditional Kwanzaa ceremony will round out the day of celebration.

And don't miss—

Garden Gate Shop Holiday Sales
Members receive 20% off!
See page 13 for details.

Holiday Preview Sale
November 5-7, 1992

Holiday Plant Sale
December 10-12, 1992

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